

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
8 March 2007 (08.03.2007)

PCT

(10) International Publication Number  
**WO 2007/027660 A2**

(51) International Patent Classification:  
*H04M 11/04* (2006.01)

(21) International Application Number:  
PCT/US2006/033650

(22) International Filing Date: 29 August 2006 (29.08.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
11/218,948 2 September 2005 (02.09.2005) US

(71) Applicant (*for all designated States except US*): IN-  
SIGNIO TECHNOLOGIES, INC. [US/US]; 19 Chal-  
fonte Drive, Lebanon, NJ 08833 (US).

(71) Applicant and

(72) Inventor: SCANNELL, Robert, F. [US/US]; 19 Chal-  
fonte Drive, Lebanon, NJ 08833 (US).

(74) Agents: GLYNN, Kenneth, P. et al.; Glynntech, INC., 24  
Mine Street, Flemington, NJ 08822 (US).

(81) Designated States (*unless otherwise indicated, for every  
kind of national protection available*): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,

GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP,  
KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT,  
LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ,  
NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU,  
SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR,  
TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every  
kind of regional protection available*): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT,  
RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA,  
GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Declarations under Rule 4.17:**

- *as to applicant's entitlement to apply for and be granted a  
patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the  
earlier application (Rule 4.17(iii))*
- *of inventorship (Rule 4.17(iv))*

**Published:**

- *without international search report and to be republished  
upon receipt of that report*

*For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.*

(54) Title: MEDICATION & HEALTH ENVIRONMENTAL, AND SECURITY MONITORING, ALERT, INTERVENTION, IN-  
FORMATION AND NETWORK SYSTEM WITH ASSOCIATED AND SUPPORTING APPARATUSES

(57) Abstract: Systems and apparatuses include devices, biosensors, environmental sensors, security related sensors, networked products, communications processors and components, alert and information components, processors, and software to support: 1) facilitating medication regimen and patient/user health administration, dosage control, tracking, compliance, information inquiry and presentation, reminder and notification; 2) providing monitoring, information, ordering, and intervention; 3) presenting the option of leveraging the preventative care, alert and notification components with other components to facilitate user or occupant well being, along with living, work area and dwelling environmental or security safety; and 4) enhancing the dwelling, living or work area with products that may be networked to support the widespread acceptance of these systems and apparatuses. The systems include a) processing, centralizing and communicating device commands and/or programs, e.g. a multifunctional device controller; b) device administration; c) patient/user information; d) dwelling environmental safety; e) security breach information; f) centralized and remote apparatus and system activations through primary component or at least one backup.



WO 2007/027660 A2

**UNITED STATES RECEIVING OFFICE**

**INTERNATIONAL UTILITY PATENT APPLICATION**

**OF**

**ROBERT F. SCANNELL, JR.**

**FOR**

**MEDICATION & HEALTH, ENVIRONMENTAL, AND SECURITY MONITORING,  
ALERT, INTERVENTION, INFORMATION AND NETWORK SYSTEM WITH  
ASSOCIATED AND SUPPORTING APPARATUSES**

MEDICATION & HEALTH, ENVIRONMENTAL, AND SECURITY  
MONITORING, ALERT, INTERVENTION, INFORMATION AND NETWORK  
SYSTEM WITH ASSOCIATED AND SUPPORTING APPARATUSES

(Attorney Docket No. RFS-107PCT)

REFERENCES TO RELATED APPLICATIONS

[0001] This present application is a continuation in part of co-pending provisional application serial number 11/218,948, filed on 02 September 2005 by the present inventor, entitled, "MEDICATION & HEALTH, ENVIRONMENTAL, AND SECURITY MONITORING, ALERT, INTERVENTION, INFORMATION AND NETWORK SYSTEM WITH ASSOCIATED AND SUPPORTING APPARATUSES".

FIELD OF THE INVENTION

[0002] The present invention relates generally to the fields of medication administration, healthcare monitoring and intervention, and dwelling, environmental safety, security and networked apparatuses and systems. More particularly, it relates to at least one or more of the following: a) systems that may comprise wireless, wired (and)/or hosted communications monitoring and intervention components to facilitate preventative care and/or patient care while minimizing the costs for medical and/or healthcare personnel; b) systems that may leverage present invention preventative care, alert and notification components with other present invention embodiments to facilitate dwelling environmental safety and security; and c) apparatuses that support the preceding and user well being, convenience and safety to provide for widespread acceptance of the preceding. In addition, the present invention also relates to pricing methods, means and services to support said widespread acceptance of the innovations described herein and associated embodiments.

### INFORMATION DISCLOSURE STATEMENT

[0003] United States Patent Application Publication No. US 2005/0101841 A9 describes a healthcare network is provided for sharing information concerning the health of a user with at least one outside source, the network including a biosensor associated with the user that generates a biosensor signal containing the information; and a personal data control means including receiving means for receiving the biosensor signal, input means for receiving a privacy input from the user, and output means for generating a response signal based on the biosensor signal and privacy input. The network also includes a data allocation and processing module including means for receiving the response signal, and means for generating and directing an output signal to the at least one outside source, wherein the module is responsive to the response signal, and wherein the availability of the information to the at least one outside source is responsive to the privacy input.

[0004] United States Patent Application Publication No. US 2005/0002407 A1 describes a method and apparatus delivering voice/data services within a piconet operating over a limited range or over a WLAN communicating with 3GPP devices by reformatting data into IP format before delivering to the WLAN. The service is short message service (SMS). Upon receipt of an SMS message, relevant routing information is retrieved. A PDGW address for the SMS message is identified and is sent to the PDGW address which identifies the WLAN user equipment (UE) for receiving the SMS and reformats the SMS message into IP format (text or encapsulation) for delivering to the UE. A protocol architecture is provided for SMS delivery over WLANs, in particular, for UMTS/CDMA based SMS over WLAN, through two alternative mechanisms, i.e., SMS tunneling and SMS proxy, for



protocols for the delivery of SMS across the WLAN. The invention enhances standard 802.11 in the context of UMTS and CDMA 2000; as well as other scenarios.

[0005] United States Patent Application Publication No. US 2004/0235416 A1 describes an apparatus, and an associated method, for facilitating personalization of a weather band radio that receives SAME messages broadcast by the NWR system. Alphanumeric indicators of locations are displayed upon a user display element. And, a listener of the radio enters, by way of a user input actuator, selection of selected geographical areas, identified by the alphanumeric indicators. The selected alphanumeric location is used to form a six-digit location code defined by the Federal Information Processing Standards (FIPS). And, the code so-formed is used by the weather band radio, selectably to alert weather anomalies broadcast by the NWR system within the selected geographical area of interest.

[0006] United States Patent Application Publication No. US 2004/0181404 A1 describes this device uses a communication link to obtain audio weather information then uses a voice recognition means to convert the audio weather information into text, then converts this text information into display information. This device uses a means selecting means to evaluate the text and determine what text is to be displayed. This device uses a display to display weather information. This device displays weather information and, can play aloud the transmitted broadcast.

[0007] United States Patent Application Publication No. US 2004/0135699 A1 describes in accordance with embodiments of the present invention, a method for alerting a quiescent person, may include recording a personal alert message, receiving an alarm over a wireless communications link, and, in response to the alarm, playing the personal alert message. In accordance with other embodiments of the present invention, a device for alerting a quiescent person may include an audio input to record a personal alert message, a memory to store the personal alert message, an audio output to play the personal alert message, a wireless receiver to receive an

alarm, a power supply and a processor, coupled to the audio input, the audio output, the memory, the wireless receiver and the power supply. The processor may be adaptively configured to receive an alert signal from the wireless receiver, and in response to the alert signal, send a play signal to play the personal alert message.

[0008] United States Patent Application Publication No. US 2004/0100376 A1 describes a wireless healthcare monitoring system and method are provided. At least one UWB biosensor transmitter is assigned to at least one individual to be remotely monitored. The biosensor transmitter includes a biosensor disposed to detect a health condition of a user and generate a corresponding biosensor reading. The reading is converted by the biosensor transmitter to an ultra wideband (UWB) biosensor signal transmitted by the biosensor transmitter. A UWB receiver disposed remote from and within range of the transmitter receives and converts the UWB biosensor signal to a signal containing information from the biosensor reading. A processor in communication with the UWB receiver processes and displays the converted signal as a readable output indicating a health condition of the user detected by the biosensor.

[0009] United States Patent Application Publication No. US 2004/0030531 A1 describes an automated system and method for monitoring and supporting and actor in an environment, such as a daily living environment. The system includes at least one sensor, at last one effector and a controller adapted to provide monitoring, situation assessment, response planning, and plan execution functions. In one preferred embodiment, the controller provides a layered architecture allowing multiple modules to interact and perform and desired monitoring and support functions.

[0010] United States Patent Application Publication No. US 2004/0003073 A1 describes a control server, or similar central processor, manages the distribution of data (including audio and video), voice, and control signals among a plurality of devices connected via a wired and/or wireless communications network. The devices

include audio/visual devices (such as televisions, monitors, PDAs, notepads, notebooks, MP3, portable stereo, etc.) as well as household appliances (such as, lighting ovens, alarm clocks, etc.). The control server supports video/audio serving, telephony, messaging, file sharing, internetworking, and security. A portable controller allows a user to access and control the network devices from any location within a controlled residential and/or non-residential environment, including its surrounding areas. The controllers are enhanced to support location-awareness and user-awareness functionality.

[0011] United States Patent Application Publication No. US 2003/0179090 A1 describes environmental condition detector with audible alarm and voice identifier. Due to the presence of various environmental condition detectors in the home and business such as smoke detectors, carbon monoxide detectors, natural gas detectors, etc., each having individual but similar sounding alarm patterns, it can be difficult for occupants of such dwellings to immediately determine the specific type of environmental condition that exists during an alarm condition. The present invention comprises an environmental condition detector using both tonal pattern alarms and pre-recorded voice messages to indicate information about the environmental condition being sensed. Single-station battery-powered and 120VAC detectors are described as are multiple-station interconnected 120VAC powered detectors. The pre-recorded voice messages describe the type of environmental condition detected or the location of the environmental condition detector sensing the condition, or both, in addition to the tonal pattern alarm. Provisions are made for multi-lingual pre-recorded voice messages.

[0012] United States Patent Application Publication No. US 2003/0098790 A1 describes an apparatus for the detection of enunciation of hazardous conditions within an environment comprises at least two detection circuits positioned to sense ambient conditions within a home or business environment. One of the detection circuits senses the presence of smoke, and the other detection circuit senses the presence of

carbon monoxide. The apparatus also comprises an alarm circuit which is responsive to each of the detection circuits for generating at least one alarm pattern, and preferably a separate alarm pattern for each different sensed condition. A voice synthesizer circuit is also included, and is responsive to each of the detection circuits for generating at least one voice message. As with the alarm patterns, the voice synthesizer preferably generates separate voice messages for each separate detected condition. The apparatus advantageously also contains an interleaving control circuit. This interleaving control circuit interleaves the alarm patterns and voice messages in a predetermined sequence to reduce confusion in an emergency situation. A method for the detection and enunciation of multiple hazardous condition within an environment is also presented, and comprises the steps of: (a) sensing ambient conditions within the environment to detect at least two hazardous conditions; (b) generating an alarm pattern and a voice message in response to sensing the hazardous conditions; (c) interleaving the alarm pattern and the voice message; and (d) enunciating these interleaved alarm patterns and voice.

[0013] United States Patent Application Publication No. US 2003/0076369 A1 describes in a system and method for the display, or presentation, of electronic information in an ambient, or pre-attentive, form, a centralized server converts textual or quantitative data into a form suitable for remotely located non-textual ambient displays, or objects. The conversion, or translation, of the information occurs in response to a set of rules which may be fixed at the server, or otherwise modifiable by a user of the display, for example via Web-based interface, or at the display itself. The translated data, referred to herein as "ambient data" is in compressed, encoded form, so as to optimize the efficiency of its periodic transmission of such data to multiple remotely located recipient displays. In one example, the display comprises an analog-type gauge having a hand that varies in angular or linear offset, or multiple hands that independently vary in angular or linear offset, in response to the received ambient data. In another example, the transmission of data from the information server to the ambient displays occurs via a one-way or two-way wireless network.

[0014] United States Patent Application Publication No. US 2002/0171670 A1 describes a personalized data delivery system for dynamically integrating viewer-specified data with visual content includes an input port for receiving a visual content signal, an output port for displaying enhanced visual content on a display screen, and an interface operatively coupled to the input port and the output port. The personalized data delivery system may also include an input/output port for receiving data from a data content source other than the visual content signal and/or for sending requests for viewer specified data to the data content source. Parameters for the selection and display of data can be customized by the viewer. The interface includes at least one processor being responsive to one or more viewer personalization parameters and operative to integrate at least a portion of the received data with the visual content signal in accordance with the personalization parameters. Memory included in the interface and coupled to the processor at least temporarily stores the personalization parameters.

#### SUMMARY OF THE INVENTION

[0015] The present invention is a system and related apparatuses that include devices, biosensors, environmental sensors, security related sensors, networked products, communications processors and components, a variety of alert and information components, processors, and software to support at least one or more of the following: 1) facilitating medication regimen and patient/user health administration, dosage control, tracking, compliance, information inquiry and presentation, reminder and notification; 2) providing monitoring, information, ordering, and intervention means in conjunction with the devices and software through components and systems that may be available in standalone or integrated forms; 3) presenting the option of leveraging the preventative care, alert and notification components with other present invention components to facilitate user and/or occupant well being, along with living, work area and dwelling environmental and/or security safety; and 4) enhancing the dwelling, living or work area with

products that may be networked to support the widespread acceptance of all present invention innovations described herein and their associated embodiments. The integration and networked means associated with the preceding may support the following: a) processing, centralizing and communicating device commands and/or programs; b) device administration; c) patient/user information; d) dwelling environmental safety; e) security breach information; and/or f) centralized and remote apparatus and system activations through at least one primary component and/or at least one backup embodiment. The intent for the embodiments is to provide the following: 1) economical and efficient care; 2) safety; 3) information dissemination; 4) response; and 5) a compelling means to support widespread acceptance of the present invention and its associated embodiments.

[0016] One of the primary utilities of the present invention system is to provide an economical and highly reliable means for and/or through third parties and/or remote components regarding the following: 1) medication administration, compliance, ordering, patient health monitoring, patient medical and vital information inquiry and presentation (different criteria and content used pending on inquiry source –family, case worker, nurse, doctor, etc.); 2) medical device metrics, device operations and programming; and 3) exception reporting, notification and intervention. Another key utility of the present invention system is to broaden the use of some of the invention components to function in conjunction with dwelling or facility environmental safety and security and to facilitate patient and/or occupant safety in the event of a medical and/or environmental and/or security emergency.

[0017] Another primary utility of the present invention system is to provide unique products with networking means to enhance a work, living, and/or dwelling area to contribute optimal utilities when networked and interacting with other present invention components to support widespread system acceptance. One of the keys to achieving the widespread acceptance of the present invention embodiments, especially in a networked means, is offering the embodiments in conjunction with at

least one associated apparatus that provides a compelling framework and value that utilizes existing infrastructure whereby the present invention embodiment, when coupled with the associated apparatus at a relatively low incremental cost, offers a new utility and a bridge for more utilities, applications, and a means for the widespread acceptance of the present invention system described herein and its associated embodiments.

[0018] There are a number of components of this system that are also individual systems and apparatuses and represent invention species unto themselves, yet they support significant utilities for the overall present invention system. The separate present invention components are: a) biosensors with transceivers that utilize a ZigBee wireless protocol and/or other wireless means and protocols; b) a Wi Fi communications backbone network and/or power line network, such as, but not limited to HomePlug™ that may utilize ZigBee-based clusters, other mesh networks, or other wireless networks and associated devices and software and account for hybrid network routers such as a Wi Fi ZigBee router; c) reliable, networked, and programmable timer (and)/or timer and controller apparatuses and systems that comprise and enable economical and unique utilities and configurations, include unique software modes and features that provide and enable a variety of utilities, and are available in a variety of embodiments, from standalone configurations to integrated routers to appliances to lighting fixtures; d) networked answering machines or apparatuses that are utilized in conjunction with other present invention embodiments; e) networked and programmable weather instruments; f) networked personal communicator and/or remote control embodiments that provide greater utility in conjunction with many of the present invention innovations described herein; g) a networked storage (and)/or storage and retrieval apparatuses and system(s) in a variety of embodiments; h) remote controlled electrical plugs and receptacles, power cords, power strips, and extension cords that may comprise multi-addressable plug receptacle switches and other related embodiments, as well as ZigBee light bulb sockets and enclosures that provide unique features in conjunction

with other present invention embodiments; i) a digital picture frame with programmable automatic network, screen, and display software utilities; j) a bar code reader with various alignment components and alignment means; k) a prescription label with at least one bar code and/or OCR alignment component for the associated scanner or reader; l) a sharps dispenser material tracking system; m) web server software programs that read content streams such as, for example, RSS feeds and activate a variety of programs such as messaging and/or push-based networked device command programs based on predetermined or personalized conditions associated with said RSS content; n) an environmental and security sensor and alert system that may comprise present invention integrated wireless and/or wired components such as, but not limited to, network addressable programmable voice messaging and speaker components, network addressable sensor alert components with wired and/or wireless communications means that may or may not have voice messaging components, programmable alarm circuits, at least one network or sub-network device or system controller, network addressable visual alert components, network addressable processors with programs for playing certain voice messages and/or activating the emission of certain audible and/or visual and/or vibratory and/or data communications notification means pending on the type(s) and/or location(s) of the sensor activations, wireless carrier and/or internet and/or facility provider messaging services to receive the notifications, and appliances and/or enclosures and/or fixtures, such as, but not limited to, lighting fixtures, emergency or first aid kits, radios, alarm clocks, radio alarm clocks which are adapted for supporting at least one of the preceding present invention medical, environmental and/or security sensor and alert system and web content components.

[0019] Another component of the present invention system and apparatuses is to support third party engagement through (a) server(s) and/or associated server-based services (which may include, but are not limited to, intra, inter, and/or extranet, as well as hosting and/or messaging capabilities). The present invention environmental and security sensor, alert and response system is incorporated herein (though it may



also exist as a standalone system), because many of its system components may be utilized to support patient and/or occupant safety and it may also be integrated with like third party services. The present invention third party services may also include a variety of advertising, marketing, and media mediums to support economy and widespread use. Another present invention utility associated with remote server capabilities and services is a pricing method for present invention components, devices and/or systems to facilitate their integration with the present invention remote and web server services, advertising and other third party web-based services and advertising.

#### BRIEF DESCRIPTION OF DRAWINGS

[0020] The present invention should be more fully understood when the specification herein is taken in conjunction with the drawings appended hereto wherein:

[0021] Figure 1 is an illustration depicting some of the present invention embodiments in communications modes;

[0022] Figures 2A through 2F illustrate a present invention main device display text sequence regarding a medication regimen;

[0023] Figure 3 shows a side view of a present invention medication tracking and aid dispenser;

[0024] Figure 4 is an illustration of a present invention main device mounted embodiment with a bar code reader, portable electronic health and medical record and communications components;

[0025] Figure 5 is another illustration of the present invention main device portable embodiment with pill compartments and another bar code embodiment;

[0026] Figure 6 is an illustration of a sample present invention network with multi-utility devices (including a present invention light fixture and digital picture frame) and sample network management components;

[0027] Figure 7 is a side view of a present invention high gain antenna and lamp harp mount and support system;

[0028] Figure 8 is a top view of the present invention embodiment depicted in Figure 7;

[0029] Figure 9 is a side view of another present invention high gain antenna and lamp harp mount and support system embodiment;

[0030] Figure 10 is an illustration of a present invention main device mounted embodiment with a portable electronic health and medical record and communications components;

[0031] Figure 11 is a sample illustration of present invention environmental, security and medical monitoring and alert system apparatuses;

[0032] Figures 12A through 12D illustrate a present invention bottle cap top communications and alert embodiment that comprises an adhesive and securing means;

[0033] Figures 13A through 13D show another present invention bottle cap top communications and alert embodiment;

[0034] Figure 14 is a side view of a present invention programmable voice recording, messaging, amplifier, speaker and communications component with a present invention lamp harp mount and support system;

[0035] Figure 15 is a side view of a present invention programmable voice recording, messaging, amplifier, speaker and communications component with another present invention lamp harp mount and support system embodiment;

[0036] Figure 16 is an illustration of the present invention pedestal module system;

[0037] Figures 17A, 17B and 17C are illustrations of some various views of the present invention modular components associated with the Figure 16 sample present invention configuration embodiment;

[0038] Figures 18 A and 18B show disassembled and assembled views of an air freshener; and Figures 19A through 19D show the wick and cartridge and combined unit including the air freshener.

#### DETAILED DESCRIPTION

[0039] There are many systems, devices and services available to facilitate medication administration, patient monitoring, intervention and the exchange of medication and patient information. Much of these innovations exist as standalone components or systems. With said systems, uneconomical and inefficient duplicity result when the user has the need for utilizing multiple devices that incorporate like processing, communications, and reporting capabilities. On the other extreme, current innovations also exist for similar components to be part of an entire system without the capability of functioning as standalone components. As a system, these components may support economy of use, but may not be as affordable as users

and/or health care constituents desire. For example, an integrated multi-functional telemedicine system may only be economically justified by in-home patients requiring daily comprehensive and/or nursing service care. The telemedicine systems also require staffing support which may also prove to be uneconomical and may not be reimbursed by insurance providers.

[0040] In addition, systems and/or devices that facilitate more economical medicine and health aid administration do not support user-friendly and/or appropriate ergonomic interfaces for patients requiring the interfaces (for example, a senior patient who may not be accustomed to a PDA, or who may not have or has no desire to have a PC).

[0041] There are a variety of medical devices or device aids that are economical and associated with optional accessories for facilitating care and feedback information. For example, a blood glucose meter may come with an alert function that is initiated when a reading is outside of a parameter range. In addition, PC software and an adapter interface may be utilized with the glucose meter for receiving, processing, storing and presenting meter readings for the end user. Though these aids are helpful, they may not be as beneficial to senior individuals who may not use a PC or others who may require more assistance. Often, family members, who are interested in the proper well being of their relatives and have a desire to help, are limited in providing care due to proximity, economic and/or time constraints.

[0042] Many of the capabilities associated with alert, notification and intervention systems exist as standalone functions and do not have the capabilities to be integrated with other types of alert, notification, and intervention systems. In addition, these systems do not have or support embodiments that are user friendly for facilitating appropriate action in the event of an emergency. Other prior art systems range from environmental sensors such as smoke, carbon monoxide, natural gas, propane and other toxic elements, to security sensors such as motion, electrical contact, and

vibration detectors. The preceding systems may account for detectors or circuits with voicing capabilities pertaining to the type of environmental hazard. One system accounts for detectors with voicing capabilities that enunciate the type and location of the environmental hazard and may be integrated in a system through a hard-wired means with limited wireless capabilities. Although they are better than systems with detectors that emit various chirps or sirens, they are limited in not accounting for at least one or more of the following: distributed components, in whole or in part, to facilitate desired action(s); broader integrated programs, applications, functions and capabilities; option to utilize a variety of wired and/or wireless communications mediums (though this filing states the preferred mediums); information dissemination and access to facilitate appropriate action(s) for a variety of constituents; and/or not having the option for being integrated with other alert, notification and intervention systems to deliver the best economy and utility for many constituents. Finally, many useful standalone systems do not gain sufficient or widespread acceptance, because they comprise standalone embodiments that do not provide a means to offer other utilities to support the widespread acceptance, such as enhancing a living or work area.

[0043] It is an object of this present invention to provide an economical and encompassing system to support broad use. A primary focus is to comprise more economical and user-friendly means to facilitate medication and health regimens and to intervene when the regimens or user health measures are outside of desired ranges for, but not limited to, in-home, assisted living users, and users at a variety of other facilities and/or institutions. The primary reasons are twofold: 1) to support economical remote party administration and intervention in medication and medical device aid and intervention; and 2) to support economical third party medication regimen and patient health inquiry from a variety of constituents, as allowed with appropriate consent.

[0044] It is another object of this present invention to provide the means to alert and inform the users and pertinent constituents, as well as others who may not utilize the medication and health aid components, when the environmental and/or security conditions of their dwelling have been breached.

[0045] Finally, it is another object of this invention to support widespread use of the innovations described herein, by providing utilities that enhance the work, living, and/or dwelling area and support an economical incremental means for enabling the user to acquire the present invention innovations described herein and their associated embodiments. The purpose for integrating environmental, security and other non-medical innovations, which may function as part of (a) separate present invention system(s), into an overall encompassing present invention is to utilize the economy, networking and integration means of the innovations and their associated embodiments to provide for more compelling present invention system utilities and usefulness.

[0046] As depicted in the Figure 1 illustration that includes communications arrows, the present invention may comprise, among other present invention embodiments described herein, the following components:

- a main device 10
- a medical device 20
- unit communications components 83, 85, 87, 89, 91, 93, 95, 97 and 99
- a blood glucose meter 120
- a device holder/interface 125
- an environmental (such as smoke) detector 240
- environmental and/or security system distributed components such as a first aid kit 180 and a lamp alert device 150
- a cell phone embodiment of a personal communicator 250
- a remote server 300

[0047] The components, namely, a main device 10, medical device 20, unit communications components 83, 85, 87, 95 and 97, blood glucose meter 120, and a device holder/interface 125, may be a medication and health system embodiment, along with a personal communicator 250 and a remote server 300. The environmental and security system embodiment may comprise a main device 10, unit communications components 83, 85, 89, 91 and 93, a detector 240, a first aid kit 180, a lamp alert device 150, a personal communicator 250, and a remote server 300. The environmental and security system and components will be covered further in this filing narrative, along with the personal communicator 250 and the remote server 300. The first aid kit 180 and lamp alert device 150 may also be accounted for in the medication and health system embodiment. All of the aforesaid Figure 1 components and unit communications components could be combined into a single cooperative system.

#### Medication and Health System:

[0048] The medical and health application embodiments of the present invention account for a system that comprises: a main device and/or at least one or more medical device components or apparatuses and/or interfaces and/or biosensors (with associated substrates) along with wired and/or wireless interfaces and components where the components may be available as integrated and/or standalone units. As integrated components, they may be integrated with the main device where the main device may provide the means for, at minimum, a communications capability and/or communications interface and/or a central processing and/or a central reporting capability. As standalone components, they may be initially purchased as such and subsequently integrated with a main device having, at minimum, the preceding capabilities. The present invention may also comprise a server-based (onsite and/or remote) component(s) to support the following: 1) remote party administration and intervention in medication and medical device use, as well as medical device programming; 2) authorized third party medication regimen and patient health

inquiry, regimen prescription downloading and ordering; and 3) a variety of reporting and information presentation capabilities.

[0049] With reference to the illustrations, a main device 10 of Figure 1, this is also the main device to be used in conjunction with Figures 2A through 2F, 4, 5, and 10, and need not be repeated in every Figure. This main device may account for the following: facilitating medication administration, supporting third party communications and comprising one or more means to support connectivity for a medication aid device and/or medical device 20 (Figure 1) monitoring and/or device control functions. Main device 10 may be in stationary (mounted) form main device 10A (Figure 4) or in portable form main device 10B (Figure 5) or and support code scanning/reader/input (such as, but not limited to, bar code, RFID and/or OCR) functionality.

[0050] The main device of the present invention discussed above and below may include of the following components:

- four categories of input components: wired and/or wireless (including RFID), coded/scanned information (for bar code, RFID and/or OCR), and/or button activated.
- four categories of output components: wired and/or wireless transmission and connectivity, audible and/or visual output means
- processing, device driver and menu-driven software to facilitate user interaction; medication administration and ordering; medication device information, functionality, operation, and inquiry; and alert, notification, reporting and communications functions
- device adapters to support connectivity to a main device docking station 40 and medical devices and/or medical device interfaces (wired and/or wireless) such as, but not limited to, a portable storage device that may include patient information and program backup, a blood meter, a blood pressure device, an



infusion device, a biometric device, an oxygen tank or concentrator, medication dispensers and/or holders and/or scale devices, sharps container information and system, and/or at least one biosensor.

- optional integrated components such as, but not limited to, a bar code reader and/or pill compartments and associated timer and components.

#### Input Components:

[0051] The four types of input components are wired, wireless, scanned/coded or button-activated. They may exist in separate or combined forms.

[0052] The wired input application component may consist of a communications interface cord, cable (such as, but not limited to, a USB – Universal Serial Bus cable), circuit or device connectors (that may support standard communications and electronics protocols and interfaces). The input sources may be, but not limited to, medical and/or medical aid devices; and/or communications devices such as a modem or Ethernet interface to link with a variety of wired network mediums; a personal, pocket, tablet or PDA computer; an external memory device; a Digital Satellite Receiver; a cable box unit; and/or electrical circuit connections to motion detectors, line-of-sight optical detectors, infra-red coded readers, lock box components, sharps dispenser components, and/or medication dispensers/holders components such as, but not limited to, lids, latches and/or springs.

[0053] The wireless input embodiment may be associated with general radio spectrum frequencies for low spectrum RF devices, higher spectrum Wi Fi devices, UWB (ultra wide band) devices, mesh networked devices, cellular devices, RFID receivers, AM and FM band frequencies, digital satellite radio, high definition radio, instant messaging devices, and other wireless messaging devices and networks. The devices may be adapted for various platforms and/or protocols such as, but not limited to, Blue Tooth, Wi Fi platforms, UWB, ZigBee, and/or proprietary closed

standards-based wireless protocols. This embodiment component may be in the form of, but not limited to, a network transmitter and receiver card and/or chip set, processor and device interface with the appropriate software and/or firmware. Another wireless input component may be an infra-red assembly.

[0054] The scanned/coded input application may consist of a scanner or receiver such as, but not limited to, a bar code reader, radio frequency identification device (RFID) reader (in a passive or active embodiment), and/or Optical Character Recognition scanner/reader. The scanning function may be associated with, but not limited to, reading medication or vitamin label information, or receiving RFID information from a variety of embodiments such as, but not limited to, tag cap, vial, and container medication information, as well as reading other RFID tags that may present exceptions to medication regimens or patient welfare, from accounting for cigarette packages with RFID tags to tracking patients and/or care providers with RFID tags. .

[0055] The button-activated input utilizes either keypad or display button. The four preceding components, along with other input means such as, for example, a touch screen display, as well as voice input and recognition means, may be embodied in (and)/or interfaced to the main device 10.

#### Output Components:

[0056] The four types of output components are wired, wireless, visual and audible. These components may also exist in separate or combined forms.

[0057] The wired output application component may consist of a communications interface cord, cable (such as, but not limited to, a USB – Universal Serial Bus cable), circuit or device connectors (that may support standard and/or proprietary and/or private communications and electronics protocols and interfaces). The output sources

may be, but not limited to, medical and/or medical aid devices; communications devices such as a modem or Ethernet interface; a personal, pocket, tablet or PDA computer; an external memory device; a cable box unit, and/or electrical circuit connections to lock box components, sharps dispenser components, and/or medication dispensers/holders components such as, but not limited to, lids, latches and/or springs. The wired output application may also be associated with remote alert devices and distributed components which will be covered further in the narrative associated with the present invention environmental, security and health sensor and alert system.

[0058] The wireless output application component may be associated with most of the same or similar devices related to the wireless input application component. The wireless output application may also be associated with remote (WAN, LAN and/or Home Area Network (HAN) based) messaging and alert devices and distributed components which will be covered further in the narrative associated with the present invention environmental, security and health sensor and alert system

[0059] The visual output application component may be, but is not limited to, a display on the main device; a display on a television, cell phone, computer, router and a variety of portable devices associated with the patient or third parties; a lighting element such as, but not limited to, a bulb or LED on the main device or on other embodiments such as, but not limited to, on medical or medicine devices that are connected (hardwired, circuit means, wired or wireless communications means) to the main device or even on a cabinet door that is associated with a medicine cabinet. Visual output could also include anything that may be seen to perceive intelligence, a signal, message, warning or alert, from the mundane (printouts) to the absurd (a pop-up flag), without exceeding the scope of the present invention.

[060] The audible output application component may be in a variety of embodiments such as, but is not limited to, a chirping device (or similar sound emitting device), (a)

programmed phone call(s), a speaker apparatus which may be connected to main device 10 and/or remote from main device 10 (such as, but not limited to, the devices covered further in the narrative as a present invention lamp alert device and other present invention distributed components as well as speakers associated with a home entertainment system), and/or programmed reminder message(s)/alert to the patient and/or alert messaging to third parties.

[0061] As noted, the preceding output components may be embodied in the main device or interfaced to the main device, e.g. main device 10, and/or interfaced to other devices associated with the main device.

#### Software:

[0062] The main device accounts for processing, device driver, administration and menu-driven software to facilitate user interaction, medication administration, prescription information, medication ordering, medication device information and functionality, device diagnostics, inquiry; and alert, notification, reporting, intervention and communications functions.

[0063] The processing software function comprises programs that may be initiated by data from primarily input sources and time/date parameters. Data from input sources may be, but is not limited to, scanned bar code information from a prescription label, a glucose level reading from a blood sugar meter, transmitted gas mix exception levels from an oxygen concentrator, and/or transmitted prescription information from a pharmacist or physician. Time/date parameters may be based on two types of metrics: time/date clock and time cycles or intervals.

[0064] Device driver software is primarily for controlling external device functions. Examples of said functions may be, but not limited to, activating a circuit lead to unlatch a lid on a medication holder associated with a pill dosage compartment and/or

activating a bar code scanner that may be mounted to the inside of a medicine cabinet, where upon the opening of the cabinet door activates a circuit switch that is connected to said bar code reader where said circuit activation may originate from a motion detector inside the cabinet facing the cabinet door.

[0065] The menu-driven software provides the user interface means for the following main functions: medication administration, medication device information and functionality, device diagnostics, inquiry; and alert, notification, reporting, intervention and communications functionality. This software may be in the form of text/list-based menu driven functionality, icon-based drop-down menu and/or pop-up functionality, as well as voice recognition software.

[0066] Figures 2A through 2E depict sample sequences associated with the present invention menu-driven software with display screen 1100 in each of the Figures.

[0067] Figure 2A illustrates a sample main menu display 101 showing time, date, the words, "Health", "Calendar", "Mail", "Coupons - Ads", and "Settings" in the main portion of the display, and the words, "Select" and "Exit" on the lower left and lower right, respectively, portions of the display. Upon depressing a scrolling button on the main device 10, the words, such as but not limited to, "Directory", "Games", "Questionnaire" and "Other" may also appear on the display. Pending on the expansion module associated with the main device 10, a "Phone" text may also appear on the display.

[0068] Upon depressing a button below the "Select" term when the cursor is over the word, "Health", the user names associated with the present invention system appear on the display, such as, "Lynne Health" and "Bob Health", as depicted in Figure 2B display 103. After depressing the button below the "Select" term when the cursor is over the word, "Bob Health", the following words may appear on the display

below the header, “Bob Health”, “Medicines”, “Vitamins”, “Devices”, “Allergies” and “Settings”, as illustrated in Figure 2C display 105.

[0069] Figure 2D illustrates the display readings upon depressing the button below the word, “Select” when the cursor is over the word, “Medicines”. The display 107 shows the fields, “Erythromycin” , “Medicine 2”, “Medicine 3”, “Medicine 4”, and “Medicine 5” may appear on the display under the header, “Bob Health”. Scrolling may enable the user to see more medicines.

[0070] Figure 2E depicts the display 109 with the readings of “Erythromycin”, “Dosage: 2”, “Frequency: 4 Hrs”, “Dosage Time: 1:01PM”, “Time Left: 02:01” which are activated after depressing the button below the word, “Select” from the preceding screen display 107 (Figure 2D).

[0071] Figure 2E display 109 also depicts the words, “Confirm” and “Back” on the respective lower left and lower right portions of the display. The “Confirm” prompt is associated with the confirmation of the user taking a medication. Even though the user may have 2 hours and 1 minute left before the next dosage, the “Confirm” prompt may appear. An alternative prompt associated with a medication dosage that is not due may be “Next” for purposes of scrolling to the next medication readout. Should the user depress the button under the “Confirm” prompt, the main device may emit a warning sequence of two chirps and display a text question such as, “Did you take erythromycin?” along with the prompts “Yes” and “No” at the lower left and lower right portions of the display. Separate questionnaire and activation sequences may take place pending on the medication, dosage and dosage time associated with the medication.

[0072] Figure 2F depicts a display 111 illustrating a sequence when it is time for a dosage. The terms, “Dosage Time: NOW” and “Time Left: 00:00”, along with “Confirm” and “Back” on the respective lower left and lower right portions of the

display may appear with this type of sequence. Upon depressing the button below the term, "Confirm", the next screen may display, at minimum, the term, "Take erythromycin pill 1" with a "Confirm" or similar prompt on the lower left portion of the display. Upon depressing the button below the confirm prompt, the screen may display, at minimum, the term, "Take erythromycin pill 2" with a "Confirm" or similar prompt on the lower left portion of the display. Upon depressing the button below the term, "Confirm", the next screen may display the sequence illustrated in Figure 2 E, with two exceptions. The exceptions may be displayed as "Dosage Time: 5:02PM" and "Time Left: 4:00".

[0073] In some of the embodiments of the present invention system, there is at least one program that displays a certain screen sequence based on a set of one or more identifiers. These identifiers may be, but not limited to a date and/or time metric, a dosage time metric, and/or an email originating and/or subject header and/or attachment name or code, as well as instant messaging content identifiers and other forms of content identifiers. Other forms of content identifier embodiments may be web server based, such as server software programs that read content streams, such as, but not limited to, RSS feeds. Said web-based content identifier programs may be integrated with device platforms, such as the present invention main device wherein said main device may receive commands and/or associated content packets from said web server associated with said content identifier programs.

[0074] One example of the use of the preceding invention embodiments is a program that displays a text message, "Call Doctor for Results" and emits one or more chirps on a cycled interval that may indicate that the display is in a message board mode based on a preprogrammed time and or date. Another variation of this message board function may be displaying an email or text message that includes the test results based on a program that screens one or more of the following identifiers: email originator, subject, message text words, and/or attachment file name, where the program is based on the activation of an interval cycled program that enables the

device to automatically call out and log on to a server for messages. With the latter identifier of an attachment file name, an attachment may be opened and displayed, upon the appropriate matching with other identifiers.

[0075] Another example of this embodiment may be displaying a digital photo, given that the display (such as, but not limited to, a LCD), driver and program supports the functionality when an email or message is received with the appropriate identifiers. An application for the present invention embodiment is automatically displaying a digital picture of, for example, a user's grandchild that may have been taken at the beach and sent or forwarded to the main device email or network address. Another embodiment of this present invention device is to display an accompanying email message or play an audio portion of the message, if the device comprises appropriate software, such as the type provided by Real Networks, Inc., and audio components.

[0076] This example may be enabled through a number of present invention embodiments, one said embodiment may comprise the following components: a communications interface and component such as, but not limited to, a modem, Wi Fi card or broadband interface; a communications program such as, but not limited to, email; a timer or clock cycle program (pending on the communications interface); a screening (identifier) program; at least one device driver program; and at least one executable program. The automatic networking component associated with the embodiment described herein accounts for, but is not limited to, utilizing a modem as the communications interface. In this configuration, the user may designate a cycle interval in which the main device modem may dial out to the user's internet service provider portal or the present invention server. Upon the modem accessing either portal, and transferring associated login, password and cookie information, the main device 10 program may launch the email access, screening, opening and displaying function based on the execution of prescriptive identifiers and tables associated with the function.



[0077] The purpose for incorporating the digital picture function as an option to this type of present invention embodiment is to account for uses for engaging user interaction, enjoyment and use of the system. Other incentives for the use of this system may be, but are not limited to, advertising, coupons, games, questionnaires, and/or news reports, as well as personalized content, which may be adapted to the main device display, networked peripheral displays and other mediums associated with the patient or system user or associates related to the patient/system user.

[0078] Another example of the present invention identifier program embodiment is utilizing a dosage time identifier. In this application, the main device display may include the prompt, "Dosage Time: Now", upon the activation of a dosage time identifier program which accounts for displaying the preceding message associated with a certain medication at a specified time and/or dosage interval. The dosage time identifier program may have a number of other functions, such as, but not limited to, playing a voice message when it is time for a certain medication and the type and dosage for the medication and/or activating a light bulb component that may be on a pill box compartment or prescription bottle cap associated with the medication.

#### Device Adapters, Interfaces and Functionality:

[0079] The present invention accounts for similar menu functionality when the user utilizes the medical device ("Device") and "Vitamins" menu sequences. For example, the "Device" sequence may account for a prompt and/or alert such as "Usage Time: NOW" for alerting the user to utilize the device.

[0080] The "Device" portion of the program may also bring added functionality to the main device 10, depending on the type of device and/or device module that may be connected to main device 10. For example, a user, device and device interaction sequence may take place with the following components: a blood glucose meter 120

(Figure 1), a cradle and/or holder and/or /interface 125 (Figure 1 - which may also be standalone, wired and/or wireless), a main device 10 (Figure 1), and unit communications components 83 and 85 (Figure 1).

[0081] A user may remove the meter 120 from the interface 125 upon being alerted and prompted by a display on main device 10 that may have included at least the following text, "Usage Time:Now". The preceding message and/or at least one form of alerts may also appear or be accounted for in other present invention embodiments of meter 120 and/or cradle 125. Upon the disconnection of meter 120 from cradle 125, a program may be initiated either on meter 120, and/or cradle 125, and/or main device 10. The activation of the program may be initiated from an electrical contact to at least one processor which was the result of the loss of connection of at least one component between devices 120 and 125. This program may perform one or more of the following functions: track the time and/or time and date from an associated processor clock in which device 120 was disconnected from device 125; and initiate a counter/counting/timer program upon the device disconnection. The counter program may have a pre-programmed interval cycle (it may also be optioned for a user-defined interval) for marking the threshold of time between the disengagement of the meter 120 from cradle 125 to the connection of the meter 120 to cradle 125. The counter program may have a series of steps and/or functions associated with time benchmarks subsequent from the passing of the threshold level. For example, in one type of configuration embodiment, a counter program (that may be residing on at least one processor in, but not limited to being in, cradle 125) may comprise a command to perform a communication function to notify an entity or person listed in a communications directory in main device 10 and transmit a message via the communications components such as, but not limited to a text message, email, and/or voice message indicating to call the user or patient of the present invention to remind them to take a blood sugar reading.

[0082] Another embodiment of the preceding configuration may comprise a data communication and function from meter 120 to cradle 125 and a threshold and execution program for transmitting metrics such as analyte information and a time and date stamp associated with the analyte reading, comparing the metrics against a target, and executing commands in the event that the information is outside of the target measure or range. Though there are devices that communicate information from the meter device through means such as an infra-red medium, the present invention offers greater utility by comprising at least one program that compares the analyte and time reading against a certain target or range, and alerts and/or notifies (a) third party(ies) in the event a certain threshold is met and/or exceeded. The application associated with transmitting the date and time stamp along with the analyte reading is to confirm that the analyte reading took place between the cycle of time in which the meter 120 was removed from and inserted back into the cradle 125. The execution, alert and communication function may utilize one or more of the components and capabilities noted in the preceding paragraph to support economy of resource use and the capability for a centralized inquiry and reporting function.

[0083] The preceding functionality applies to other present invention components, such as, but not limited to, other forms of biosensors and associated devices, processors, chip sets, programs, substrates, interfaces and wired/wireless communications capabilities. The preceding will be covered in greater detail herein.

[0084] Another embodiment of this present invention blood meter 120 configuration is a meter with the functions and components of cradle 125 integrated into the meter as one system. More specifically, the meter may have a timer, alert, exception execution program and communications function integrated as one system. The purpose for such a configuration may be to support the functionality of the preceding system in a more compact and portable arrangement. The communications component(s) associated with such a system may be in the form(s) of a variety of wired and/or wireless components, such as, but not limited to a modem or digital

[0102] Another set of invention embodiments accounts for devices and associated equipment that facilitate the use of capturing the coded information through a means that supports the process for administering the medication and vitamins. An example of the embodiment is main device 10A illustrated in Figure 4, where a reader 124, RFID, and/or OCR; reader mount and/or other associated equipment and/or components that may be mounted and/or adhered to, but not limited to, a cabinet door or connected to the equipment that is on the door, preferably the inside of the door. As the user removes a medicine or vitamin container or packet from the shelf of the cabinet, the user may scan the container in front of (as associated with a bar code or OCR reader) or near (as associated with a RFID tag reader) the reader 124, RFID, and/or OCR.

[0103] The reader 124, RFID, and/or OCR may be connected to a processor that may have a variety of programs such as those noted in this narrative, but not limited to the programs noted in this narrative, or may be connected to a set of processors with the programs. As previously stated, it is important to note that the reference regarding processor and electrical connections, throughout this narrative and present invention text described herein, may account for wired and/or wireless connections. A present invention embodiment of the processor linkage may be not only a cabinet display, such as previously noted, but not limited to, a LED display or LCD, with text, icons and/or a color scheme to remind the user of taking other vitamins or medications, but the reminder information may also be displayed, but not limited to, on a television, computer, PDA, or cell phone screen (which may belong to the user and/or (a) party(ies) associated with the user or a trigger condition, pending on the criticality of the information).

[0104] Another present invention embodiment for facilitating the process for medication regimen is a main device 10 as described herein that incorporates at least one or more of the following: a pill box container 135 (Figure 5) , and/or another scanning means 137 embodiment (Figure 5).

[0105] The pill box container may comprise at least one or more pill compartments and may also contain a means for informing the user about the relevance of each respective compartment and/or the medication regimen sequence associated with each compartment. This means may range from, but is not limited to, accounting for basic day or time of day markings, to comprising a light bulb or LED in proximity to each compartment which is activated at the appropriate regimen time, to comprising a locking means for all compartments and locking the compartments except for the compartment associated with the appropriate medication regimen sequence, to opening a latch associated with the appropriate compartment based on a present invention embodiment of having a spring loaded latch or door associated with each compartment.

[0106] The present invention scanning means 137 embodiment (Figure 5) may comprise the following: a recessed aperture with a depth and width for accommodating a variety of prescription, medication and/or vitamin bottles, an aperture bottom which rotates and may have alignment markings to facilitate the placement of a bottle, a rotating mechanism and/or means such as a motor for rotating the aperture bottom, a scanning component (such as, but not limited to, an infrared bar code scanning component), and at least one program software component for enabling the scanning, capturing and execution of present invention device functions associated with the scanning of the coded information.

[0107] Figure 5 is an illustration of this main device 10B embodiment, though it may be available in a variety of other embodiments. It may comprise all of the forms of input, output, processing, and communications components as previously described in the text.

[0108] The pill box container 135 may be made of a durable moldable plastic composite with associated low cost plastic compartments and low cost plastic or

[0129] The benefits of utilizing biosensors over a network which includes low cost and reliable wireless means and/or in conjunction with the economical and user friendly components or interfaces of the present invention, coupled with the monitoring, reporting and intervention means of the system, may support a widespread acceptance of such a system. The applications of the components along with future biosensor breakthroughs are quite broad.

[0130] The biosensor and present invention components may be used for detecting, monitoring, treating and/or intervening on, but not limited to, the following:

(a) a variety of diseases or conditions caused by the diseases such as, but not limited to:

– heart disease, through detecting and measuring myoglobin, troponins, fatty acid binding protein, etc., or detecting an enzyme to enable notification and intervention regarding a potential cardiovascular problem; or cardiovascular and respiratory health (accounting for pre- and post-heart attack detection/monitoring, oxygenation, respirations, stroke detection/monitoring/intervention, pneumonia detection, sleep apnea detection)

- renal disease, through measuring blood or urine samples for, for example, in-home or dialysis patients

- diabetes, for example, as noted in other parts of this narrative, blood glucose levels

(b) a variety of infections or conditions caused by the infections such as, but not limited to:

- urinary tract infection; bacterial infections through analytes such as, for example ESBL enzymes (for drug-resistant bacteria), yeast infections, ear infections, influenza, etc.

(c) a variety of cancers, such as detecting risk factors for cervical cancer by monitoring human papilloma virus from a pap smear, or bladder cancer through markers in urine such as a nuclear matrix protein called BLCA-4 which is in bladder cancer cells, or detecting prostate cancer through analytes in body fluids such as urine

(d) tracking the effectiveness of a pharmaceutical agent such as an antibiotic

(e) tracking stress through saliva sampling for cortisol or serotonin levels.

[0131] Some of the biosensors and related components associated with the preceding applications are available through firms or entities such as i-Stat Corporation, Motorola, Matritech, Affymetrix, Biacore International AB, Thermo BioStar, Inc. (for fertility monitoring and ovulation detection), Roche Diagnostics, and Johnson & Johnson, to name a few.

[0132] In support of providing an economical and effective means for facilitating reliable and widespread patient care, it is a preferred embodiment of the present invention system to utilize a ZigBee-based wireless communications network with the associated software and communications components for most of the biosensor systems associated with the present invention.

[0133] ZigBee is an open wireless network software layer protocol based on the IEEE 802.15.4 standard and is intended to support networking of a variety of devices, from lights to wireless smoke and CO<sub>2</sub> detectors, to wireless home security, to utility metering. The network utilities associated with the preceding devices support similar data communications applications and networked infrastructure needs for the medical

devices and/or interfaces described herein for controlling the devices and obtaining device status.

[0134] The ZigBee embodiment associated with some of the medical devices and/or respective interfaces of the present invention supports the functionality of sending a short burst of information if a trigger event occurs, such as an analyte reading or timer interval falling outside of a parameter range or a daily set of transmissions associated with device readings. This functionality also supports a key component for widespread acceptance of the present invention, which is economy. Many of the device interfaces associated with the present invention are designed for low power consumption, simplicity, low cost, and communicating small amounts of data, such as, but not limited to, meter readings, the type of meter, and the identification of the individual associated with the meter reading. These attributes match with a ZigBee network Reduced Function Device (RFD). For medical device wireless interfaces requiring additional functionality, the ZigBee standard accommodates such functionality through a Full Function Device (FFD). The FFD may also operate as a router and an overall network coordinator. In functioning as network infrastructure components, they may support a variety of network topologies, such as star, cluster tree, and mesh.

[0135] ZigBee, being designed for the hostile RF environments that routinely exist in mainstream commercial and industrial applications, supports the critical need for reliable communications associated with medical device and/or biosensor information. It incorporates an IEEE 802.15.4 defined CSMA-CA (carrier-sense medium-access with collision avoidance) protocol that reduces the probability of interfering with other users and automatic retransmission of data ensures robustness. Utilizing Direct Sequence Spread Spectrum with features including collision avoidance, receiver energy detection, link quality indication, clear channel assessment, acknowledgement, security, support for guaranteed time slots and packet freshness; ZigBee offers biosensor and medical device manufacturers and users a highly reliable, standards-based solution.



[0136] ZigBee-compliant products operate in unlicensed bands worldwide, including 2.4GHz (global), 902 to 928MHz (Americas), and 868MHz (Europe). Raw data throughput rates of 250Kbps can be achieved at 2.4GHz (16 channels), 40Kbps at 915MHz (10 channels), and 20Kbps at 868MHz (1 channel). The transmission distance between a set of ZigBee devices may range from 10 to 75m, pending on power output and environmental characteristics. The preceding range may be enhanced with repeaters. In addition, devices, as part of a variety of network topologies, may communicate through network nodes. A ZigBee network can support 264 nodes. The networks may also be linked through network coordinators to support extremely large networks. The present invention initial user targets of in-home, assisted living, hospital and institutional care facilities may be supported through the network size capacities.

[0137] ZigBee utilizes the four basic frame types defined in 802.15.4: data, acknowledgement (ACK), media access control (MAC) command, and beacon.

[0138] The data frame, as previously noted, may include up to 104 bytes. The frame is numbered to ensure the tracking of all packets. It also accounts for a frame-check sequence structure to ensure that packets are received without error. The present invention embodiments described herein may be designed around data packets comprising 20 bytes. This data load is recommended for use in a node that may comprise 30 like ZigBee transceivers.

[0139] Another key structure for the 802.15.4 standard is the acknowledgement (ACK) frame. It supports providing feedback from the receiver to the sender to confirm whether the packet was received without error. A ZigBee-compliant device takes advantage of specified "quiet time" between frames to send a short packet immediately after the data-packet transmission.

[0140] The MAC command frame supports the mechanism for remote control and configuration of nodes. It may be used to configure individual clients' command frames no matter how large the network.

[0141] The beacon frame helps support long battery life by waking up client devices, which listen for their address at differing cycles and go back to sleep if they don't receive it. Beacons are important for mesh and cluster-tree networks for keeping node synchronization without requiring the nodes to consume battery energy by listening for long periods of time. ZigBee networks may also comprise non-beacon functionality.

[0142] Security and data integrity are key components of ZigBee technology. ZigBee components such as access control lists, packet freshness timers and 128-bit encryption based on the NIST Certified Advanced Encryption Standard help protect data transmission. It leverages the security model of the IEEE 802.15.4 MAC sublayer which accounts for the preceding through four security services: access control (maintaining a list of trusted devices within the network; data encryption; frame integrity (to protect against modification by parties without cryptographic keys; and sequential freshness to reject data frames that have been replayed.

[0143] ZigBee devices may utilize low power consumption and may be battery operated with alkaline batteries.

[0144] ZigBee chip sets are available from Ember, Motorola and Atmel. The ZigBee Alliance ([zigbee.org](http://zigbee.org)), an organization that promotes and supports the ZigBee standard, has over one hundred members.

[0145] Another set of invention embodiments that may utilize a wireless protocol such as ZigBee, very effectively and economically in conjunction with the present invention main device is associated with an oxygen device such as an oxygen tank or oxygen concentrator with its associated gauge and/or meter. The components associated with this invention embodiment account for the following: a main device; at least one communications component and program; at least one program and processor with at least one gas mix and gas level threshold; an interface (including wired and/or wireless communication) to a tank gauge or meter and/or concentrator

gauge or meter; and a tank gauge or meter and/or concentrator gauge or meter and associated equipment.

[0146] In this present invention oxygen device embodiment, a meter processor may be measuring a concentrator gas mix and/or level or an oxygen tank gas level and communicating the data to a ZigBee transceiver chip set on either a low periodic and/or parameter exception basis which may transmit the data to a main device 10 chip set which is connected to at least one processor on the main device 10. Upon main device 10's receipt of and recognition of the ZigBee transmission from the oxygen device ZigBee transmission via the originating address code in the ZigBee frame, the main device 10 ZigBee chip set relays the oxygen meter information to the main device 10 microcontroller. The processing of the information may account for comparing the gas mix or level information against a target and executing a command set program associated with the comparison result. One example of the commands may be to communicate a reorder of oxygen to a present invention main and/or remote server. The server, upon receipt of the oxygen reorder message from a certain user's main device 10 (where the message may comprise appropriate and associated login and user member information) may generate an order to the supplier/service entity which supports the user or user member health plan.

#### Other Networked Embodiments

[0147] ZigBee or similar reliable, coded wireless embodiments may be comprised in other present invention embodiments (as noted in previous provisional patent filings) to enhance the living area in which the patient or user resides or works and support additional utilities, such as, for example, security functions. For example, decorative present invention multi-utility enclosures such as, but not limited to, vases, urns, appliances, fixtures, bases, stands, and/or pedestals may comprise a present invention system of integrated modules such as, for example, a motion detector, a controller

processor and timer, an electric air freshener, and/or a ZigBee chip set and associated components, or other wireless communications components, whereas upon the opening of an entryway door, the motion detector may activate a motion detector circuit lead that may connect to a controller circuit lead which may activate a preset program (from a table of programs) to turn on an air freshener and/or transmit, for example, (a) ZigBee frame(s) to activate a certain light or set of lights. The controller program may activate a timer circuit lead that may connect to an air freshener circuit lead and the lead may remain in an on state for a preset period of time. The ZigBee transmitting function circuit connection may be shut off by the timer circuit upon the timer processor's receipt of an acknowledgement from the remote light ZigBee chip set that the frame was received where the acknowledgement is received by, for example, the pedestal ZigBee chip set module and the acknowledgement is relayed to the controller processor. Upon the conclusion of the timer interval associated with the air freshener and/or remote light(s), the controller processor may shut off the timer circuit lead electrical signal powering the air freshener, thus causing the freshener to shut off. Upon the conclusion of the timer interval associated with the transmission connection to the ZigBee chip set, the connection may be activated for receiving a signal from the timer.

[0148] One of the purposes for the acknowledgement relay and timer circuit disconnect is to support a remote light staying on for a certain period of time, as governed by the timer program, in the event that another family member or pet activates the motion detector where the activation may have caused the transmission of a ZigBee packet to activate the light switch where the activation may shut off the light before it is desired to do so. Another means for removing the latter potential problem is accounting for a present invention intelligent light processor that upon receiving a coded wireless command set (such as a ZigBee frame) may send the instruction to a processor that governs light operation where upon the receipt of an instruction frame command to turn on the light, compares the command with the state of the light circuit connection by having the circuit connection having a lead and

associated components terminating into the processor. In the event that the light circuit connection is in an on-state, the light processor does not change the state of the light circuit. Should the light circuit connection be in an off-state, then the command set would activate the processor to activate the light circuit relay lead to turn on the light.

[0149] Another means for activating multiple functions in place of or in conjunction with a motion detector module in the preceding present invention is a personal communicator receiver module. The module may be in a variety of embodiments such as, but not limited to, a personal wireless car key receiver, a Bluetooth receiver, an infra-red receiver, an RFID reader, a ZigBee receiver, a UWB receiver, a cellular network receiver, and/or a Wi Fi receiver. The module may receive transmissions from a variety of personal communicator embodiments, in part or in whole, such as, but not limited to, a cell phone, a smart phone, an RFID tag, a PDA, a pocket PC, a wireless key, a smart card, a wearable item such as a piece of jewelry, ring, watch or pendant with a wireless data communications means, such as, but not limited to, a RFID chip set and transmitter, and power means. The receiver module may be integrated with the other present invention modules of the present invention multi-utility enclosure and may be supported by associated enclosure apertures and framing, powering, communications, circuitry and securing means. The receiver module may also comprise a data communications means and/or interface to the present invention controller or timer program processor. Upon the receipt of at least one data packet where the packet may identify a certain individual and may originate from, for example, that individual's personal communicator transmitter to the present invention's module receiver to the present invention's controller or timer module processor, the processor may activate a program that comprises the activation of one or more modules associated with the individual's interests, profile or transmitted command(s). The activated modules may be within the enclosure or remote from the enclosure. The activations may range from those noted in the preceding paragraphs to room temperature settings, to present invention wall outlet plugs for activating, for

example, lamps or electric air fresheners, to kitchen appliance activation to air ionizer settings and activations to networked, automated, movable shelving, closet conveyor, and/or carousel settings, positions and/or rotations. In addition, the personal communicator transmission may also include at least one data packet that may enable the activation of a security or medical or environmental mode program which supports another utility for the modules as described in the following paragraphs. The communications means that supports the multi-utility enclosure and external apparatus utilities may be ZigBee, UWB, Bluetooth or other wireless data means, as well as wired means such as HomePlug or Ethernet compatible networking, or a combination of the preceding. The preferable wireless embodiments for the preceding invention embodiments are ZigBee and RFID-based configurations.

[0150] The security or alert utility for the present invention multi-utility enclosure configuration described in the preceding paragraph provides additional benefits for a variety of users. The apparatus which enhances a living or work space area during certain periods of the day or evening as previously described, may also serve a dual purpose as a security or alert enhancement. In a security function mode, the motion detector module, upon the detection of motion, may activate a circuit connection to the controller and timer module processor, where the connection may activate a preset program (from a table of programs), which in this example mode, is a security mode program, where the program executes the controller processor to transmit, for example, a ZigBee network chip set address or set of addresses over a data circuit connection from the controller processor module to the ZigBee wireless communication module. The ZigBee network address(es) may be associated with ZigBee communications receivers that are connected to alarm or alert data circuits or circuits that may activate an alarm, alert or processor function associated with the receipt of the signal.

[0151] Another mode embodiment associated with the present invention utilizes a mode command to generate a specific program. This mode command is especially

useful for communicating necessary action from a Home Area Network communications device in the event of an emergency, where the mode function may support an optimal (and)/or backup communications means. For example, a present invention wearable alert apparatus, such as, but not limited to, a pendant, may comprise at least one button and communications processor and transmission means where the transmission originating from the pendant may comprise a series of destination addresses and content data packet, where the data packet may contain a medical mode command, where one destination or primary address may be to a main device 10, which upon receipt, processes and generates a series of outputs to support a desired response, and another address may be a backup address which may be to, for example, a multi-utility enclosure (such as, but not limited to, a pedestal) communications module and timer and controller module which may receive, process and generate another series of outputs that may utilize some or alternate devices or instructions to support the backup actions in the event that the primary source or apparatuses associated with the primary source encounter an operational problem. The mode command application may also apply to an environmental and alert apparatus or system.

[0152] The administration and setting of (a) preset program(s) that may be associated with either security or medical or environmental or other mode functions may be administered by four means: 1) a local communication means by a user through a variety of devices, such as the variety of previously described present invention personal communicators or remote controls; 2) a remote means through a remote server which may receive input from a variety of sources with appropriate security and authentication logins; 3) through a timer program, as described further in the narrative; or 4) through an administration/keypad interface.

[0153] The following narrative section and associated illustrations will describe this decorative present invention security and environment enhancing embodiment in more detail. The purpose in covering the apparatus in more detail in this section,

which has accounted for mostly medication and health monitoring and alert system narrative, is to support the use of the apparatus in the system to support the acceptance and use of sensor monitoring and alert systems while minimizing intrusive effects, by enhancing a patient's or user's living area with functionality such as, but not limited to, emanating a fragrant scent. Further in the narrative, another application will be illustrated to support the added utility benefits of the sensor system apparatus.

[0154] One present invention system embodiment that may support sensor and alert system acceptance and enhance a living and/or work area with the modularity and integration characteristics described herein is a chemical and chemical dispenser component such as, but not limited to, an electric air freshener component and/or module 24 (Figures 16 and 17). This module 24 may be connected within or to a multi-utility enclosure system, such as, for example, a pedestal embodiment with other module components to comprise new invention systems, such as, but not limited to, a multi-utility enclosure flower vase pedestal 22 (Figures 16 and 17). This system may utilize, among a variety of other modules, a motion detector component and circuit functionality along with a processor controller and timer module and circuit. One application associated with one form of this embodiment is an example of a motion detector triggering a communication to activate lights upon an entry way door being opened. In addition to the lights being turned on upon the opening of the door (given that a preset program supporting the function is activated), a timer function may be activated as a result of an electric signal connection originating from the motion detector module, transmitting over the circuit termination between a motion detector module 11 (Figures 16 and 17) and a controller and timer module 29 (Figures 16 and 17) to the controller module processor. The activation of the timer module may cause the activation of a timer and a circuit connection from the timer to an air freshener dispenser heating unit, where the heating unit may be activated by an electric current originating from the timer and traveling over a circuit and circuit connecting interface between the timer module and the electric air freshener module. The activation and operation of an air freshener heating unit would cause the



emission of an aromatic scent from an essential oil residing in a container (which is also modular, interchangeable and interconnecting with the air freshener electrical and heating housing component) and emanating out of the container through a vapor permeable plastic composite conduit such as, but not limited to, a wick that resides along the bottom portion of and protrudes upwardly out of the container through a top portion of the air freshener module. The heating unit may be on for a designated period of time, governed by the timer module, at a designated diffusion setting, which may be set manually (by accessing the underside of pedestal 22 or through a top portion aperture of pedestal 22). Other invention embodiments may account for a controller processor and air freshener connector that may comprise circuit leads that account for diffuser settings whereby the diffusion level may be activated or changed through the processor controller. The processor controller may also change a different scent emanation by integrating with components capable of said functionality.

[0155] The relevance of performing the preceding functions through modular components associated with a pedestal may have a variety of significances when the pedestal may be associated with supporting a vase that contains silk or some form of artificial flowers or fresh flowers. For example, a vase may contain silk roses, and the pedestal associated with the vase may have an aromatic dispenser module emanating a rose scent, in addition to other modules and associated functions. These functions, when performed through an integrated modular means as described in the previous example, provide even greater utility and benefits to the user, such as, from extending the life of the air freshener essential oil to serving as a security entry way sentry when the motion detector interacts with the controller processor in a security mode program or as a backup medical or, for example, fire alert (and)/or communications safety support device, where the embodiment comprises the associated timer and controller module program, along with the associated communications module with software enabled receiver and multi-address transmission means, such as a ZigBee chip set and associated components.

[0156] Figures 16 and 17 illustrate the application stated in the preceding paragraph and the following flower vase pedestal 22 modules in mostly block form: motion detector 11; timer and controller 29; communications component 14; electrical housing 23; and air freshener 24.

[0157] Flower vase pedestal 22 is comprised of the following components: an exterior housing with a variety of apertures; an interior modular frame with slots for a variety of modules and module release buttons 19; an electrical housing 23 with a back frame 6 and a center frame 7.

[0158] The exterior housing may be in a variety of shapes and designs, such as but not limited to, from a contemporary form which is depicted in Figure 16 to a more ornate and intricately detailed form whether it may be, for example, Oriental with associated carvings or a part of a ceramic figurine. The housing comprises at least one horizontal planar surface to support a flower vase. It may also be composed of a variety of materials such as, but not limited to, inexpensive moldable plastic composites, pottery, clay and/or more expensive porcelains or woods with a variety of finishes and possible inlays (such as precious minerals or woods).

[0159] The exterior apertures support modular functionality, housing, venting and exterior design. Apertures on the front facing and side portions may support motion detector motion sensor functionality, wireless module communications, module ventilation and design. The back side consists of one aperture area to support the electrical housing back frame 6 and electrical cord connections. Top apertures may be located in four areas: the main planar surface area (for certain pedestals); the top front; the top sides; and the top back. The main planar surface may comprise apertures for the module release buttons 19 (which will be covered further in this narrative) and the timer module 29 input and output means 37. The top front apertures may be for an air freshener diffuser component and aeration, ambient sensor functionality and module ventilation. The top side apertures may be for ambient

sensor functionality and module ventilation. Certain pedestals may also have top side apertures for an air freshener diffuser component and aeration. Certain pedestals may have a top rear side or corner component for wireless communications antennae (as needed, pending on the wireless application). The top back portion apertures may be for module ventilation. An optional aperture cover component for covering top component non-aeration apertures that are associated with modules that the user may plan on purchasing in a subsequent period may also be available for the pedestal. The underside of the exterior housing component is primarily hollow with interconnecting components such as, but not limited to, inserts, grooves and clips to accommodate the various invention module embodiments associated with the present invention.

[0160] The interior modular frame is comprised of an outer frame component with slots to accommodate modular inner chamber frames and interconnecting components such as inserts and clips to secure the frame to the underside of the exterior housing component. The outer frame component consists of a front and side portions. Preferably, there is no back or rear portion, because the open area may be used to accommodate an electrical housing 23 back frame 6. The modular inner chamber frames may be comprised of cross braces with interconnecting components such as slots for connecting to the outer frame and modules and also projected movable clipped interconnecting components for securing and releasing module components.

[0161] There are a variety of embodiments and interconnecting means for comprising and supporting the securing and releasing of modules to the variety of present invention enclosures, pedestals and bases.

[0162] An illustration of one embodiment, out of a variety of many embodiments, for a movable interconnecting component is depicted in the air freshener illustration, Figures 17A, B and C. Figure 17C depicts a side view of a module release button 19 and its associated movable components. Release button 19 has a top portion that is primarily flush with the pedestal top main planar surface with recessed sides that fit

within a wider aperture located on the underside of the associated exterior housing area. The button 19 has a bottom portion that resides slightly off the center of the top portion of a hinged clipped interconnecting component (the button bottom portion is on the opposite side of the hinged means). The bottom side of the hinged component that is on the opposite side of the bottom clip portion has a spring pushing against it. The spring is in a recessed holder that comprises an upper enclosure that supports the cross hinge that connects through the clipped interconnecting component. The holder is part of the inner modular frame. The operation of the components described in this paragraph will be covered in the air freshener module narrative.

[0163] The interior modular frame and its associated components such as the module slots and module release buttons 19 may be comprised of inexpensive durable and moldable plastic.

[0164] Referring now to Figure 17A, the electrical housing 23 is comprised of two primary components: a back frame 6 and a center frame 7. The frames provide a means and configuration for electrical current to transit through the present invention modules. The frames have electrical interconnecting means and settings (such as, but not limited to, dip switch settings) to support a variety of inter and intra module electrical connections.

[0165] The back frame 6 component may be comprised of module electrical connector (primarily female plug receptors) components and a central electrical housing component with electrical connector feeds to the back frame module electrical connectors, the center frame 7 main electrical connector, and the main electrical cord or electrical cord connector. The back frame 6 may comprise at least one setting (such as a dip switch or on/off setting) for supporting (an) electrical module connection(s) in an on or off state. One of the purposes for the setting is related to the operation of an electric air freshener module (which will be explained in the air freshener portion of the narrative). The central electrical housing component

comprises the electrical connector feeds to the electrical components previously cited in this paragraph. Back frame 6 may comprise a low cost durable plastic and/or rubber for the frame/housing that supports the electrical connector components, and electrical conducting materials such as copper for the electrical connectors.

[0166] The center frame 7 is comprised of most of the components and materials of back frame 6 with the exception of the receptacle/housing and connectors for the main electrical cord. In addition, frame 7 may comprise at least one aperture for supporting a module-to- module electrical and/or data connection. An example of the purpose for the aperture may be to support an electrical timer module power connection directly from the module to an electric air freshener module.

[0167] Both frames 6 and 7 may connect to the inner portion of the exterior housing and the interior modular frame through a variety of interconnecting components such as but not limited to, inserts, clips, screws and grooves. The preceding interconnecting components may also be adhered to the respective frame connections by glue or other bonding means.

[0168] The motion detector module 11 is comprised of the following components: motion sensor 1; main electronics and circuitry 2; module interfaces 3; an electrical housing interface 4; circuitry settings 5; and an exterior housing. The motion sensor 1 is comprised of sensing circuitry, conducting and connecting components and materials. Sensor 1 connects to the main circuitry component 2. The main circuitry component 2 is comprised of circuitry and circuitry connectors to circuitry settings 5, module interfaces 3 and the electrical housing interface 4 and associated circuitry, conducting and connecting materials. The module interfaces 3 may be comprised of male and/or female electrical connectors, and associated receptacles and housings. The interfaces 3 are comprised of currently available conducting, resisting and connecting circuitry materials such as, but not limited to, copper, and plastic and rubber composites. The electrical housing interface is comprised of electrical

conducting and resisting materials, such as, but not limited to, copper and consists of a male plug and resistor for interfacing to the electrical housing. The motion detector circuitry settings 5 are primarily for setting on and off states for the respective detector module interfaces 3. These settings may be comprised of dip switches with a plastic outer housing and electrically conducting or resistant connectors. The module 11 exterior housing may be comprised of, but not limited to, a moldable plastic material or hard synthetic rubber composition. The exterior housing comprises interconnecting components such as, but not limited to, clips for holding the module components, especially the circuitry and connecting enclosures in place and secured from undesired external exposure. As appropriate, some of the exterior housing fastenings may be adhered to other component interconnectors by a bonding means or compound such as, but not limited to, glue.

[0169] The operation of motion detector 11 may be illustrated in the example noted in this paragraph. Upon receiving current traveling from the wall socket to the male plug of the pedestal 22 electric cord, where the cord may terminate into the back frame 6 central electrical housing component, and the current travels through the back frame 6 electrical connectors and the center frame 7 electrical connectors and may travel from frame 7 into the detector 11 electrical housing interface 4, where the current travels through the detector 11 circuitry, the detector is in an active state. Upon the opening of a front door, which is located in proximity to the pedestal 22 which comprises motion detector 11, the sensor unit 1, originates an open circuit connection from 1 to the main circuitry component 2, the connection travels out towards the module interfaces 3 and may reach the interfaces 3, pending on the circuitry settings 5 settings for continuing or breaking the circuit connection. In the configuration embodiment described herein, the circuitry settings 5 are optioned to support electrical connection solely to the controller and timer module 29, where the module comprises a processor for supporting security and/or non-security enabled functions. Given that the present invention accounts for this module in a variety of enclosures and may be interconnected, integrated and/or associated with a variety of

modules, it supports additional circuitry and processor designs to support a variety of configurations and functions.

[0170] The controller and timer module 29 may comprise the following components: processor, program, main electronics and circuitry 30; timer program and circuitry 31; module interfaces 33; electrical housing interface 35; input and output means 37; data circuit 41; circuitry settings 39; and an exterior housing. The controller and timer module 29 is comprised mostly of the same circuitry and connecting materials that are comprised in the motion detector module 11. The distinctive circuitry is associated with providing data communications through data circuit 41 from the processor 30 to the communications module processor 13. In addition, the input and output means may be comprised of a variety of components and materials. One embodiment of means 37 is comprised of a planar interface that has a LED display and at least one input button and at least one program sequence or step button. The means 37 may be comprised of a translucent and durable hard plastic display component and other durable plastic and/or rubber materials. The timer program resides on a processor 30 with input and output components that are connected to the input and output means 37 and the module 29 circuitry. The circuitry settings 39 are comprised of the same materials and components of the settings 5 that are associated with the motion detector 11. The module 29 exterior housing may be comprised of, but not limited to, a moldable plastic material or hard synthetic rubber composition. The exterior housing comprises interconnecting components such as, but not limited to, clips for holding the module components, especially the circuitry and connecting enclosures in place and secured from undesired external exposure. As appropriate, some of the exterior housing fastenings may be adhered to other component interconnectors by a bonding means or compound such as, but not limited to, glue.

[0171] The processor 30 and timer program and circuitry 31 may support a prompt-based user input function of programs and sub-programs for each module device that

is interconnected (either within or external to the pedestal 22) to module 29. The present invention accounts for a Set program and an Interval program.

[0172] An example of the operation of the program consists of the following for setting the operation of an air freshener module which is identified as Device 1. The display of input and output means 37 may display the time of day, such as 5:30 P above a step or sequence button that may be located on the bottom left side of the display. On the right side of the display, the characters IN may be displayed above the input button that may be located on the bottom right side of the display. Upon pressing the input button, the left side displays, ALARM. Depressing the input button associated with this prompt would enable the user to initiate a timer program for the start and stop times and days associated with activating a communications transmission to at least one alarm device upon the receipt of an electrical signal generated by the motion detector module 11. Upon pressing the step or sequence button associated with the ALARM prompt, the prompt, DEVICE 1, is displayed. Upon pressing the input button associated with the DEVICE 1 prompt, the left side displays, SET 1 (which is for the first time setting for device). The next input button depression displays, TIME. Upon the depression of the input button, the word, START, is displayed. The depression of the input button causes the word, HOUR, to display. The next character displayed is the number, 1. The user may either depress the input button to set the start hour at 1 or depress the step button to scroll through the number characters to the desired start hour. If the user desires to set the air freshener to turn on at 6:30 PM, then the user scrolls to 6 and depresses the input button. The next set of characters displayed are, MINUTE. Upon the depression of the input and step buttons in the manner described in this paragraph, the user sets the start time for 6:30 PM and the next display sequence is STOP. Upon the final input of the stop time, the next display item is, DATE. If the user desires to not set a date, the user may depress the step button for the display of, SET 2. If the user desires no other designated setting time for the air freshener, the step button may be depressed for the display of, RANDOM. If this function is not desired, the depression of the



step button displays the word, INTERVAL. The purpose for the INTERVAL function is to set the duration for powering the specific device or module (DEVICE 1) that is connected to the timer module 29. The user, following the preceding logic functions stated in this paragraph, may set the power interval for one hour and fifteen minutes, by depressing the input button upon the display of the word, INTERVAL, then depressing the input button upon the display of, HOUR, then depressing the input button upon the display of, 1, then depressing the input button upon the display of, MINUTE, and finally keeping the step button depressed until the number 15 is shown on the display, the user lifts his/her finger from the step button and depresses the input button. The display then shows the characters 1H 15M and the user depresses the input button to set the air freshener to operate for one hour and fifteen minutes upon the activation of the motion detector module in pedestal 22.

[0173] The communications module 14 is comprised of the following main components: transceiver, processor, and main electronics and circuitry 13; module interfaces 3; an electrical housing interface 4; circuitry settings 5; antenna 18; a data circuit 19; and an exterior housing. The transceiver 13 may be connected to an antenna 18 that resides within the module 14 housing or resides outside of the housing 14 and protrudes upward from a rear corner aperture of the pedestal. The antenna may be no more than three inches. The communications module 14 is comprised of the same circuitry, interface and connecting materials that are comprised in the motion detector 11 and timer 29 modules. The circuitry settings 5 are comprised of the same materials and components of the settings that are associated with the motion detector 11 and timer 29 modules. The transceiver, processor and main electronics and circuitry 13 may support and comprise, preferably, ZigBee components or other wireless protocols, such as, for example, Bluetooth or Wi FI, as well as wired communications components. The module 14 exterior housing may be comprised of, but not limited to, a moldable plastic material or hard synthetic rubber composition. The exterior housing comprises interconnecting components such as, but not limited to, clips for holding the module

components, especially the circuitry and connecting enclosures in place and secured from undesired external exposure. As appropriate, some of the exterior housing fastenings may be adhered to other component interconnectors by a bonding means or compound such as, but not limited to, glue.

[0174] The module 14 transceiver, processor and main electronics and circuitry 13 connects to the module interfaces 3, the module 14 electrical housing interface 4, circuitry settings 5 and the antenna 18. The module interfaces 3 associated with the circuitry in this narrative sample configuration are connected to the controller and timer module 29 and the motion detector module 11. An open circuit connection is associated with only one module, the module 29. The module 14 electrical housing interface is connected to the back frame 6 electrical connector receptacle. The circuitry settings 5 are set for open circuit connections (since the motion detector 11 setting associated with the interface for module 14 is closed, no contact will be transferred from module 11 to module 14). The data circuit 19 is for connecting the processor 13 to the controller and timer module 29 data circuit and processor.

[0175] The operation of the communications module 14 that is associated with the present invention integrated module configuration described herein is based on the electric power source connection that transits into the module electrical housing, through the main circuitry and to the transmitter component; and a circuit connection from the timer module which is originated from the motion detector module 11.

[0176] The air freshener module 24 is comprised of the following components: main circuitry 13; module interfaces 3; an electrical housing and interface 4; circuitry settings 5; heating unit and transfer plates 25; chemical agent cartridge and vaporizer conduit 26; and an exterior housing for the electrical, circuitry and heating components. The air freshener module 24 is comprised of the same circuitry, interface and connecting materials that make up the respective like components in the other present invention modules. The circuitry settings 5 are also comprised of the

same materials and components associated with the settings that reside in the other present invention modules. The heating unit and transfer plates 25 are comprised of components for supporting a small heating unit means such as, but not limited to, a coil resistance heater or a metal oxide resistance heater as well as electrically conductive material such as copper for the transfer plates. The chemical agent cartridge and vaporizer conduit 26 may be comprised of a translucent hard plastic material for the cartridge for displaying (in this illustrated invention embodiment) a liquid form agent and a vapor permeable plastic component for the conduit which may be, but not limited to, a wick. The module 24 exterior housing may be comprised of, but not limited to, a moldable plastic material or hard synthetic rubber composition. The exterior housing for the electrical, circuitry and heating components comprises interconnecting components such as, but not limited to, clips for holding the module components, especially the circuitry and connecting enclosures in place and secured from undesired external exposure. As appropriate, some of the exterior housing fastenings may be adhered to other component interconnectors by a bonding means or compound such as, but not limited to, glue.

[0177] The module 24 main circuitry 13 connects to the module interfaces 3, the module 24 electrical housing interface 4, circuitry settings 5; and the heating unit transfer plates 25. The module interfaces 3 associated with the circuitry in this narrative sample configuration connect to the controller and timer module 29. The circuitry is secured in place through the fastening and support means of the exterior housing assembly. An open circuit connection is associated with the module 29. The module 24 electrical housing interface is connected to the back frame 6 electrical connector receptacle. The back frame 6 electrical connection may have an off switch setting that is associated with module 24 for this sample configuration, because the power source for the module is generated from the controller and timer module 29. As previously noted for this respective configuration, this module 29 to module 24 connection is supported through an aperture in the electrical housing 23 center frame 7. The circuitry settings 5 are set for open circuit connections. The heating unit is

connected to the transfer plates. The heat transfer plates are connected to the main circuitry 13, the electrical housing interface 4 and the heating unit. The chemical agent cartridge may be connected to the module 24 exterior housing through a variety of interconnecting means that support attachment to and detachment from the housing. The means may be male protruding edge components and female grooved slots. Additionally, the cartridge may also be held in place through the movable interconnecting means supported by module release buttons 19 and associated components. The vaporizer conduit associated with this invention embodiment 26 previously described in this narrative may reside along the bottom portion of and protrude upwardly through and out of a top aperture of the cartridge container. The conduit also passes through an aperture in the exterior housing where the housing area performs the following functions: supports an inner portion heat transfer component that may consist of parallel plates that, though concealed in the housing, surround a portion of the vaporizer conduit to facilitate evaporation; and also supports the venting and dispersion of the chemical agent through its structural form. The exterior housing, in addition to providing the structural support and connecting means for its contained components and the dispersion of the chemical agent or scent, also has a portion that connects to and may also protrude through a top exterior housing aperture of pedestal 22 as depicted in Figures 16 and 17.

[0178] The operation of the air freshener module 24 that is associated with the present invention integrated module configuration described herein is based on a power source connection that passes through the controller and timer module 29 and module 24 interface that is originated from the back frame 6 electrical housing connection 4 associated with timer module 29 that transits through module 29 circuitry out to the module 29 to module 24 interface upon the activation of an open circuit which may be caused by two conditions – the activation of a time and/or date set timer program and/or the activation of motion detector 11.

[0179] Upon the activation of a pre-programmed time start set program, the controller and timer 29 processor may open a circuit current for the circuit lead(s) that connect(s) to the module 29 to module 24 interface. The electrical current may transit from the module to module interface to the module 24 circuitry and through the circuitry to the heat transfer plates. The heat transfer plates serve a dual purpose of conducting electricity and heat when the latter element is caused by the activation of the heating unit from the electric current that transits the heating transfer plates and terminates into the heating unit. The heating unit emanates heat in the direction of the heating transfer plates that may reside, though concealed in the module exterior housing, alongside the chemical agent container and, as previously noted, the vaporizer conduit that protrudes from the container. Even though the heating unit shuts off upon the loss of power due to a pre-programmed stop time, the scent emanates for a longer period from the stop time and the essential oil or other form of chemical agent lasts for an extended life.

[0180] As noted, the air freshener module 24 may also be activated by motion that causes the activation of the motion detector module 11. In this scenario, the electrical connection that originates from module 11, transits through the module 11 to module 29 interface and connects to controller and timer module 29 circuitry, activates the circuit lead that activates the controller and timer 29 processor to activate the interval program and open the circuit leads associated with the module interfaces 3 that are associated with the devices and/or modules associated with the interval program. The electric current traveling over the circuit leads and transiting to the module 29 to module 24 interfaces triggers the operation of the air freshener module 24 in the manner described in the preceding paragraph.

[0181] The air freshener module 24 in pedestal 22 is one embodiment of 24 which may be part of, but not limited to, a module enclosure, housing or networked device. This module embodiment may be in other forms as a standalone or networked (with other air fresheners, modules, sensors or other components) unit. Being networked, module 24 may be linked to processors and software and/or sensors to function at

different emanation levels with different scents (for example, with a multi-cartridge oil and wick module or cleanser components. For example, an ambient light sensor may interconnect to module 24 and a sunrise may activate a program to emanate a coffee scent. Another example may be a module comprising or being connected to a device comprising a timer or timer parameter where the module may release a rose scent in the morning and a lavender scent in the evening. Being networked or integrated with other components, the air freshener module may be adapted for a variety of invention embodiments. Other invention embodiments may range from a decorative enclosure that may function as a night light and adapted for an air freshener module, to a jack-o-lantern enclosure with a flickering, dimmer and/or constant illumination component that may have an air freshener component that emanates a pumpkin scent or autumn scent, to illuminated (or non-illuminated) seasonal or holiday themed containers, vases, urns or like enclosures that may emanate a pine scent or pot-pouri scent where the scents may emanate from an air freshener with a timer or networked component that may cause the activation of the freshener. Another embodiment may comprise a means for providing an alert function when, for example, but not limited to the example, an essential oil quantity, mixture or level in a vial, cartridge, or chamber may be close to a near empty level. The alert function may be activated when, for example, a certain contact is not immersed in the oil component or a certain sensor detects a different chemical composition, and the contact or sensor causes a circuit connection for an alerting function to trigger the operation of an illumination, audio (such as causing a chirping sound), and/or communications component(s).

[0182] The communication may be generated through a pin activation on a data or electrical interface embodiment that may be integrated between the air freshener module 24 and the controller and timer module 29. The pin may be connected from a circuit relay in module 24 to a receiving circuit which may terminate in the module 29 controller processor. Upon the receipt of the contact signal, the module 29 processor may generate a program that activates, for example, a ZigBee transmission which may be addressed to a main device 10. The ZigBee transmission may

comprise a message indicating the freshener liquid is at a certain level. Upon the receipt and processing of the message, main device 10 may activate a program which may generate a variety of outputs, such as, but not limited to, from displaying a message on the device 10 display and emitting a message alert beep to transmitting a communication to the present invention server 300 to transmit a text message to a user's PDA or, pending on the PDA configuration, transmit a communication that may generate adding a certain scent cartridge to a PDA Shopping List program. The originating message may contain more information when integrated with a present invention embodiment of an air freshener module 24 that may comprise a processor.

[0183] The air freshener module 24 is an embodiment of a chemical and chemical dispenser module component that may be in a variety of present invention embodiments, such as the air freshener components and enclosures described herein, as well as a present invention embodiment comprised of an insect repellant module that may be integrated or added to a fixed or portable outdoor lighting component. The dispenser modules may consist of a heating component or a spray component for diffusing the chemical agent. The active chemical agent, pending on the application, may, therefore, be functioning as any of the following: a fragrance; air freshener; deodorizer; odor eliminator; insecticide; insect repellant; herbal substance; medicinal substance; disinfectant; sanitizer; mood enhancer; aroma therapy composition; and/or a combination or like substance. It may be in liquid form, such as a volatile essential oil for an air freshener agent, which may be synthetically formed and/or naturally derived. An air freshener agent for the embodiments described herein may also be in gel or solid form. Figure 18A and 18B show disassembled and assembled views of an air freshener exterior housing 603 and base 601; and Figures 19A through 19D show the wick 607 and cartridge 609 and combined unit including the air freshener housing 603 and base 601.

[0184] One of the present invention embodiments of providing the means to integrate an air freshener, motion detector, timer, communications component, as well

as a security sentinel in a space-saving and electrical outlet-saving decorative enclosure such as, but not limited to, those described herein or pedestal provides a number of benefits to the end user. The convenience of having certain lights turn on along with having a pleasant, relaxing fragrance emanating from a decorative display in a non-cluttered entry way, upon the opening of a front door (especially an apartment front door, where space may be at a premium) and having the added security functionality when the preceding is in security mode or comprises a backup medical (and)/or environmental alert program, enhances the quality and safety for the end user (without having the basic concerns of having to navigate through a dimly lit apartment with bundles, a bag and/or a brief case or forgetting to extinguish a burning candle). In yet another embodiment of the pedestal and integrated module system described herein, said system may comprise a RFID tag reader that may be supported by a program that interacts with said motion detector and a ZigBee transceiver module. In one interaction, the RFID reader may activate a ZigBee transmission to a controller and timer that activates a certain mode program associated with the user who may be wearing a pendant with a RFID chip set and transmitter, wherein said transmitter emits said RFID signal that is received by said RFID reader when said pendant is within proximity, for example, within 10 feet, of said reader. If said pendant emits a signal that comprises a data identifier that matches an identifier set residing in a memory table associated with said controller and timer mode program, the pedestal module configuration comprising a processor, memory and an RFID identifier table may also comprise a program that generates the transmission of a ZigBee packet associated with activating said mode program associated with said user. In another interaction, said activated motion detector may activate a program residing on at least one processor in said pedestal module configuration that performs an inquiry on whether the RFID reader received a RFID signal and whether said signal (if received) comprised a matching identifier. If said inquiry response comprises a null receipt or a non-match result, the associated program action may be to transmit to said controller and timer a standard motion detector activation packet, wherein said controller and timer would activate a program associated with the mode



said controller and timer is engaged under at the time of the receipt of such transmission. The preceding RFID and motion detector inquiry interaction sequence may support the convenience of a present invention system user to not have to disengage an alarm mode upon entering an alarmed entryway, if said user is wearing the appropriate RFID tag that supports said application functionality.

[0185] Pedestal 22 (Figures 16 and 17), like other invention enclosures, pedestals and bases described herein may have a number of embodiments to account for other various module configurations as well as accommodating existing standalone electrical (or electrical socket) fixtures or products (such as, but not limited to, night lights, bug repellents and air fresheners). For example, Figure 16, also illustrates pedestal 22 with an electrical plug socket 27 (the pedestal may have more than one plug socket) and decorative modular and interchangeable housing 28 on its front portion (which also may have the configuration on other side or circumference portions), to accommodate, among other electrical socket fixtures or products, an air freshener or air freshener and night light combination. The electrical socket may be connected to an electrical connector which may be connected to a cord or a device controller component or a controller and timer module 29, which may also be connected with a motion detector module. The decorative modular and interchangeable housing 28 may be available in a variety of designs, patterns and colors to coordinate with vase, urn, or other vessel designs, forms, patterns or colors. The pedestal 22 may also have a circuit breaker and reset function to account for electrical loading and UL requirements.

[0186] To further enhance the living area associated with the preceding pedestal 22 description and illustration, the multi-utility enclosure embodiment modular system configuration may perform additional activations through the controller and timer module and the communications module. The embodiment of the controller and timer module program may comprise a day mode program that may be administered as a second step or sequence menu prompt, after the "ALARM" prompt, as described

a variety of embodiments, and, additionally in or with a variety of products, services, configurations and utilities where the conjunction or integration supports other present invention embodiments. When coupled with a variety of present invention embodiments that comprise a communications component with a compatible protocol, especially, but not necessarily, a ZigBee protocol, such as, but not limited to, a pedestal 22 with the various preceding embodiments, these present invention switch embodiments provide a utility system that offers greater variety, reliability, capability and economical value than any other timer (and)/or device controller and/or sensor and alert system.

[0190] One of the preceding present invention wireless electrical switch apparatuses may be in the embodiment of a wall outlet plug-in housing and an assembly plug receptacle comprising: an outer portion standard outlet electrical plug which is connected to an inner portion main electrical circuit where the circuit terminates into a switch or junction; at least one outer portion electrical plug receptacle; an inner electrical circuit connected to the at least one receptacle and the circuit switch or junction; a wireless communications processor with the associated standard electrical and electronics components, memory and a software program and associated configuration that controls the electrical circuit switch or junction; and an antenna that is connected to the communications processor. As previously stated, the preferred communications component associated with the preceding is ZigBee.

[0191] The operation of the embodiment may be illustrated through the continuation of the pedestal 22 day mode example. Upon the program execution of transmitting one or a variety of command signals to specific ZigBee-equipped devices that are associated with the day mode program residing in the pedestal 22 controller and timer module 29, at least one of the ZigBee-equipped devices that may be receiving the signal may be the present invention wireless controlled electrical switch apparatus. The apparatus, upon receiving the transmission, sends back an acknowledgement frame to the originating pedestal 22 communications module processor, and processes

the signal by activating the switch to open the circuit connection to the plug receptacle.

[0192] Said wireless controlled electrical switch apparatus may be adapted with a timer device where the embodiment may have a variety of option settings and associated circuitry and offer greater utility as described in this narrative section. Wherein said present invention embodiment may offer the user a localized interface and capability for a timer function, as well as the option and benefits and capabilities of a remotely controlled capability wherein the control may be generated from a remote control unit (and)/or a networked timer (and)/or a networked timer and controller embodiment, as well as a remote networked server. The embodiments will be covered in more detail further in the narrative.

[0193] Another similar embodiment of the preceding is accounting for a communications controlled electrical switch functionality in a portable light bulb socket. The socket enclosure innovation may comprise the following: an outer portion standard-sized grooved bulb socket electrical contact, fitting and housing that comprises heat dissipating elements; the socket electrical contact and fitting is connected to an inner portion main electrical circuit where the circuit terminates into a switch or junction; the housing comprises a bulb socket receptacle where the receptacle comprises a contact to the electrical switch circuit; an inner electrical circuit connected to the at least one receptacle and the circuit switch or junction; a wireless communications processor with the associated standard electrical and electronics components, memory and a software program and associated configuration that controls the electrical circuit switch or junction; and an antenna that is connected to the communications processor in the heat dissipation housing where the housing may be comprised of, but not necessarily, a durable plastic composite with associated securing, fastening (and)/or bonding means similar to what has been described in the present invention embodiments described herein. .As

previously stated, the preferred communications component associated with the embodiment is ZigBee.

[0194] Another version or enhancement for the preceding embodiments may account for an ambient sensor, processor and program or an ambient sensor, program and processor adapted for communications, switching and ambient sensor processing where the embodiment may generate a communication in relation to a remote device command and the lighting condition associated with the command. The embodiment may, for example, communicate to a user or remote control device that a light in the designated area is already on or that a switch associated with a light, such as a lamp, may be in an off position. For example, upon the receipt of a ZigBee transmission that comprises a data packet to turn on a switch, the processor may, upon reading the instruction, activate a value comparison program that compares whether an ambient light sensor is activated, and performs a step or series of steps based upon the value associated with the ambient sensor reading. If the ambient sensor is not activated, the program may generate an electrical current switch that opens the circuit to enable the lamp to turn on. Upon the execution of the switch change, the program may execute another ambient sensor comparison. If the sensor is not activated, the program may proceed to a new instruction code that initializes a transmission back to a designated device indicating that the lamp is not turned on (this condition may be associated with a bulb burn-out or the light switch being in an off position). The latter utility is particularly helpful in a situation where a house may be empty over extended periods of time and a lamp bulb may burn out. The sensor may be comprised in, for example, a present invention security system with a device controller or controller function, such as the present invention multi-utility router, access point or range extender which will be covered further in the narrative, where upon receiving a ZigBee communication from a designated plug associated with a designated lamp, may activate a program that generates the activation of another lamp and reports the ambient sensor activation to a present invention remote server. Another related embodiment to the program functionality is a transmitted instruction to not run an

ambient sensor program in association with a power activation command. The use for the program may apply to a day mode command where the individual desires a designated light to be turned on in the middle of the day. In yet another embodiment associated with the activation or non-activation of an electrical circuit, said networked plug may comprise an energy meter and associated processor, program and memory wherein upon the reading and match of an energy meter, associated with said plug's activation, reaching a certain usage level, said plug and housing assembly component configuration may support the communication of said threshold to a present invention main device, wherein said main device may comprise a program that, at minimum, generates an activation for a transmission of a command data packet that accounts for turning off said electrical circuit.

[0195] The wireless plug-in switch apparatus described herein may be available in a variety of embodiments where the embodiments are also present inventions either in separate or combination forms, in whole or in part. The embodiments may be, but are not limited to, the following: plug-in night lights (and)/or electric air fresheners (and)/or ambient sensors (and)/or processors (and)/or USB interfaces (for present and future innovations such as improved sensors) (and)/or air ionizers (and)/or LED lights, where the embodiments may be available in a variety of decorative forms or colors. The embodiments may also comprise plug-in sensor and alert system distributed components, as described further in the narrative. The embodiments may also comprise processor and voice messaging functionality where the message may be generated from a program table and voice chip and memory that may comprise a variety of messages where each message is associated with the receipt of a certain type of signal. The functionality is supported where the wireless communications means provides for a data packet message, such as, but not limited to, ZigBee or Bluetooth. The preceding present invention voice messaging apparatus will also be described further in the narrative. The sensor and alert system distributed components may also be available in a variety of embodiments where one apparatus, for example, may comprise a battery and an additional alert means where the alert

means may be activated upon the plug-in unit incurring a loss or degradation of electrical current.

[0196] Additional present invention embodiments that build upon the preceding wireless plug assembly switch are multiple plug (and)/or apparatus receptacles that may be in the form of an extension cord with a multiple plug receptacle adapter or a plug-in multiple plug receptacle or a plug-in embodiment as noted in the preceding paragraph that may comprise at least one additional plug receptacle, where the forms may be available with a range of circuit switch, processor and program embodiments (and)/or configurations. For example, a plug-in multiple plug receptacle housing and assembly may comprise: an outer portion standard electrical outlet plug which is connected to an inner portion main electrical circuit where the circuit terminates into a main electrical circuit switch or junction and a wireless coded communications processor interface; at least one or more outer portion electrical plug receptacle(s) which are connected to inner portion receptacle electrical contact plates; at least two or more inner electrical circuits where each circuit is connected to a respective plug receptacle electrical plate or an outer portion apparatus housing and assembly (such as, but not limited to, those described in the preceding paragraph) where each circuit receives contact from a main receptacle circuit upon the activation of a main electrical circuit switch being open and where the main receptacle circuit connects with the main switch and each inner associated receptacle electrical circuit; a wireless communications transceiver and processor with the associated standard electrical and electronics components, memory and a software program that controls the circuit switch or junction, and an antenna that is connected to the communications processor where upon the receipt of a communications transmission that contains a designated address for the transceiver, the transceiver sends an acknowledgement upon the receipt of the wireless transmission to the originating transmitter or transceiver address of the transmission, and processes the command associated with the transmission where the command is associated with the control of the electrical circuit switch or junction. As previously stated, the preferred communications

component associated with the preceding is ZigBee. Even though the preceding may account for sensor and alert system distributed components in plug-in embodiments, it is preferable that said embodiments be included in the preceding configuration solely if said components are activated in an always-on state. Said networked plug and plug receptacle assembly and housing may also support a range of additional embodiments, such as, but not limited to, from said embodiments comprising rechargeable batteries to embodiments comprising two plugs for optimizing electrical loads and device configurations powered from conventional wall outlets.

[0197] Said preceding embodiment may comprise the range of configurations, components and programs associated with the previously described present invention wireless communications plug-in switch apparatus. The distinction with this present invention embodiment and the previously described innovations is that this embodiment may activate more apparatuses, fixtures, devices, etc., because of the additional plug receptacles (and)/or circuits.

[0198] The extension cord embodiments related to the preceding may be available in a variety of forms which may be based on the location of the wireless communications component in relation to the following cord and electrical apparatus positions: at or in proximity to the electrical plug end; at some portion along the electrical cord; or at or in proximity to the plug receptacle(s).

[0199] The wireless communications electrical plug end placement embodiment may comprise: an outer portion standard outlet electrical plug which is connected to an inner portion main electrical circuit where the circuit terminates into a switch or junction; a wireless communications processor with the associated standard electrical and electronics components, memory and a software program and associated standard configuration that is connected to and controls the electrical circuit switch; an antenna that is connected to the processor; and a standard set of electrical wires that connect from the electrical switch to the standard extension cord plug receptacle(s) and

assembly where the wires and receptacles are comprised within their respective standard housings.

[0200] The wireless communications electrical cord placement embodiment may comprise: an outer portion standard outlet electrical plug and housing which is connected to a standard set of electrical wires assembly and cord housing; the electrical cord wires connect to an electrical switch or junction at some portion of the cord embodiment; at the portion, a housing comprising a wireless communications processor with the associated standard electrical and electronics components, memory and a software program and associated standard configuration that is connected to and controls the electrical circuit switch; an antenna that is connected to the processor; and a standard set of electrical wires that connect on the other end of the electrical switch and extend to the standard extension cord plug receptacle(s) and assembly where the wires and receptacles are comprised within their respective standard housings.

[0201] The wireless communications electrical plug receptacle placement embodiment may comprise: an outer portion standard outlet electrical plug and housing which is connected to a standard set of electrical wires assembly and cord housing; the electrical cord wires and housing may extend out and connect a plug receptacle housing which is adapted to accommodate a wireless communications processor, antenna and associated components; within the modified housing, the electrical cord wires may terminate into an electrical switch or junction; the wireless communications processor is electrically configured with the standard electrical and electronics components, memory and a software program and associated standard configuration that is connected to and controls the electrical circuit switch; the antenna is connected to the processor; and a plug receptacle and housing portion that comprises at least one set of standard electrical circuits and plates that connect to a main receptacle circuit where the circuit terminates at the electrical switch junction.



[0202] One of the main purposes for accounting for differing placements of the wireless communications component within the present invention extension cord embodiments is to support optimal communications range for the ZigBee communications components. The utility variety is important for supporting the widespread acceptance of networked homes, especially for the initial household deployments of ZigBee.

[0203] The preceding wireless communications extension cord placements may also be associated with present invention power cord embodiments for any electrically powered apparatus such as, but not limited to, lighting fixtures, appliances, and other devices. Even though the wireless capability may also be prevalent within the structure of the device, fixture or appliance, the primary advantage of placing the wireless components outside of the respective preceding device structure applies to minimizing manufacturing, assembly and design costs. This minimal design, manufacture, and assembly cost focus is particular suited for many types of lighting fixtures. The present invention power cord embodiments are, especially, suitable for table or floor lamps.

[0204] One of the power cord embodiments for lamps that utilizes most of the preceding innovation components and concepts, yet is adapted for providing greater utility to a lamp or similar electric powered device is a power cord switch that utilizes wireless communications (and)/or manual switching means. The present invention power cord innovation may be in a variety of embodiments.

[0205] One embodiment of the preceding accounts for supporting a lamp activation from a remote apparatus regardless of the manual switch setting associated with the lamp. One of the embodiments that may support the functionality may comprise a manual circuit switch which may be comprised in a housing near the proximity of the base of the lamp and has an inner portion that comprises two leads where the leads connect to the manual mechanism and where one of the two the leads is activated at

any given point in time and becomes activated as a result of the manual activation of the switch. Each lead may terminate into an interface that is associated with a processor which comprises a program, a clock, and memory and is connected to associated electrical and electronics components. Upon the activation of the manual switch, where the activation changes the active or inactive state of each lead, the newly activated lead sends a signal into the respective interface that terminates into the processor, where the activated interface triggers the processor to generate a program to record the new active lead condition. The program also generates a sequence to call up a switch register record to read the most recent switch activation source and command state, where the source may be, but not limited to, a manual switch, a remote unit, or a timer unit. The source may be identified because the wireless communication protocol, such as, but not limited to, ZigBee, may include the transmitting originating address associated with the unit and the data may be received, processed and stored in memory. The other source means is the manual switch and the record may register the manual switch activation because of the interface leads that terminate into the processor interface that are associated with the manual switch. The program may also generate a sequence to record a voltage sensor reading of the circuit connection that is on the power cord portion between the manual switch and the lamp. The program then may execute a match and IF, THEN sequence, where upon reading, for example, that the voltage sensor detects an on-state condition and the last command received was to turn the lamp on, and the command was generated by a timer activation, then the processor may activate the electrical switch control to position the switch and register the manual switch activation in an off-state condition. The program may also generate a transmission to the communications receiver associated with the timer processor record (and)/or system device controller (which may be the timer processor) that the lamp is in an off-state. The switch and power cord embodiment may comprise the same or similar components associated with the preceding embodiments. The manual switch outer portion may be in a variety of embodiments such as, for example, a dial, toggle or foot bar (pending on a floor vs. table lamp) where the movable portion is connected to

an inner electrical circuit plate and wire set where the movable portion, upon moving to a setting, makes contact with one of two the leads, and causes the lead to be activated. The outer portion may be comprised of a durable plastic composite.

[0206] The preceding present invention manual and processor-controlled switch embodiment may be adapted for or comprised in or with other apparatuses (and)/or fixtures, such as, for example light switch assemblies. The adaptations are understood by any one skilled in the art to be construed as present invention embodiments.

[0207] Another present invention embodiment and associated function that accounts for another level of utility for a wirelessly controlled plug-in apparatus and housing that utilizes most of the preceding components and/or configurations is controlling the current or relay activation of each electrical circuit that is associated with each plug receptacle or apparatus connection on a per circuit or receptacle or apparatus housing basis while utilizing only one electrical plug receptacle or power cord enclosure. This present invention innovation provides the greatest utility and economy and the least expensive means for activating a cluster of fixtures, devices (and)/or appliances in portions, at once and/or at different times by utilizing one electrical outlet and one communications processor. The innovation provides a number of benefits such as, for example, supporting the on-state for present invention sensor and alert system secondary support distributed components (described further in the narrative) while controlling the power for present invention embodiments that provide more use when at least one individual is in the living area – such as, for example, air fresheners. The innovation is also highly suited for power strips for home offices or small business where the communications processor may reside in the power strip component and be connected to the associated power strip receptacles where the receptacles may be controlled by a remote timer and controller that may control other household or office system functions and may also turn certain power

strip plugged in devices off at the end of the day and leaves others on continuously such as, for example a fax machine, router, firewall and/or an answering machine.

[0208] These innovations may be available in a variety of forms. Three of the forms are plug-in receptacles or extension cords or, as noted, power strip embodiments, as well as embodiments of the preceding forms comprising, as noted two plugs for optimizing electrical and appliance loading.

[0209] The plug-in multiple plug receptacle embodiment may comprise: an outer portion electrical outlet plug which is connected to an inner portion main electrical circuit where the circuit terminates into a main electrical circuit switch or junction and a wireless coded communications processor interface; at least one or more outer portion electrical plug receptacle(s) which are connected to inner portion receptacle electrical contact plates; at least two or more inner electrical circuits where each circuit is connected to a respective plug receptacle electrical plate or an outer portion apparatus housing and assembly where each circuit receives contact from a main receptacle circuit upon the activation of a respective receptacle circuit switch being open, where each receptacle inner electrical circuit is connected to a respective receptacle circuit switch and each receptacle circuit switch is connected to a wireless coded communications processor interface, and also upon the activation of a main electrical circuit switch being open and where the main receptacle circuit connects with the main electrical switch; a wireless communications transceiver and processor with the associated standard electrical and electronics components, memory and a software program that controls the main and receptacle circuit switches or junctions through the interfaces; and an antenna that is connected to the communications processor, where upon the receipt of a communications transmission that contains a designated address for the transceiver and a data content packet of an associated address for a respective interface lead for a respective circuit switch, the transceiver sends an acknowledgement upon the receipt of the wireless transmission to the originating transmitter or transceiver address of the transmission, and processes the

command associated with the transmission where the command is associated with the control of the electrical circuit switch(es) or junction(s).

[0210] The receptacle switches may be activated by a remote device through one communications processor by utilizing a wireless coded means, such as, but not limited to, ZigBee or Bluetooth, where the communications code may comprise data packets that include a sub-address code associated with each receptacle switch which is associated with the main address of the multi-plug receptacle.

[0211] The extension cord and power strip embodiments may comprise the multiple plug receptacle component, processor, memory, program, configuration and functionality described in the preceding two paragraphs.

[0212] All of the preceding electrical embodiments add more functionality to the present invention system and associated innovations described herein, as well as to previously filed present invention systems, such as, for example, pedestal 22.

[0213] The purpose for illustrating some of the preceding previously filed present invention embodiments in this filing is to account for the versatility of the embodiments while also complementing their interaction with the distributed present invention and multi-utility components which also include the sensor and alert system and apparatus innovations described herein. One example of the complementary use may be in supporting a family with an elderly relative residing in their home who may require certain assistance. The enclosure 22 may reside in a hallway corner where the hallway may connect to the elderly relative's bedroom or bathroom. During the day pedestal 22 may function as an air freshener as previously described. In the evening, the pedestal 22 may activate the hall light and activate a speaker and processor in a fixture, such as lamp alert device 150 (Figures 1 and 11), which is described further in the narrative, where the device, upon the receipt and recognition of the transmission from pedestal 22, may play an alert voice message, such as

“Activity, gram’s hallway”. Another multi-utility enclosure may have a similar motion detector, controller, timer, and communications configuration, in another room, such as a kitchen, whereby, upon the triggering of a motion detector, subsequent module interaction may activate the play of another message in the device 150, such as, “Activity, kitchen”. In yet, another set of present invention embodiments, said pedestal or other multi-utility enclosure or networked plug-in plug receptacle and housing may comprise an RFID reader, where upon the elderly relative, wearing a pendant or other wearable item comprising an RFID tag, entering a hallway or kitchen, said system may track and report said relative’s location or location proximity.

#### System Networking with Application Specific and Multi-Utility Apparatuses:

[0214] The present invention system accounts for many components that facilitate user well being and safety. Said present invention embodiments support numerous applications to help achieve this intent. Said present invention embodiments are also comprised of economical and highly reliable components, configurations and deployments to help deliver said intent to targeted users and constituents for widespread acceptance.

[0215] Many of these innovations contribute optimal utility when networked and interacting with other present invention components. One of the keys to achieving the widespread acceptance of the present invention embodiments, especially in a networked means, is offering said embodiment in conjunction with an associated apparatus that provides a compelling framework and value that utilizes existing infrastructure. When the associated apparatus is adapted to work with the present invention, the new present invention embodiment offers a new utility and a bridge for more utilities, applications, and a means for widespread acceptance of the present invention system described herein and all of its embodiments.

[0216] This present invention apparatus is a networked timer which may be standalone, adapted for, adapted with, or comprised in and/or for a variety of embodiments. One of the key sets of embodiments for the timer is an adaptation for network routers, access points, or range extenders or networked apparatuses or networking equipment that may embody a combination of the preceding which may also, but not necessarily, include other functions, some of which will be disclosed herein. The networked timer may be deployed for and through wired (and)/or wireless networked devices (and)/or devices or apparatuses that may be integrated with the networked devices, including the present invention innovations described herein. The networked timer may be integrated with a router, access point, or range extender or work in conjunction with the preceding or combination embodiment thereof that may be a sole or hybrid network device.

[0217] The present invention networked timer may also be a standalone device or apparatus and may comprise a variety of communications, integration, access, and administration means and embodiments. For example, one embodiment may comprise a transceiver or transmitter for transmitting at least one coded communication where the transmission is generated by the execution of a timer processor, program with an associated clock and calendar embodiment, and memory, where the communication comprises at least a receiver or transceiver network (and)/or device address that is associated with an apparatus or apparatus program that is designated to be activated upon receipt of the transmission originating from the timer. In addition, the timer may be programmed to activate and/or turn on and/or off a plurality of devices or apparatuses.

[0218] Said timer may be comprised of the preceding processor, program, memory, a communications processor or embodiment with associated software, memory, and antenna (the timer utilizes, preferably, wireless communications which is preferably, but not necessarily, ZigBee), an administration means, and associated electrical and

electronics circuitry and means. The preceding components may be comprised in a compact housing (which may be comprised of, but not necessarily, a durable plastic composite) with associated fastening and securing means. The circuitry and housing may accommodate the wireless antenna and a USB (and)/or Ethernet (and)/or modem interface(s). The Ethernet interface may be plugged into a Local Area Network (LAN) port of a router and support administration and access means, where the networked timer may have its own IP address for system administration, settings, (and)/or activation through any browser enabled device within a HAN, LAN or WAN. The benefits of the preceding administration means will be described further in this narrative. The USB interface may be used for PC or PDA-based administration. The modem may be used as another means for remote administration, where the administration may be performed, for example, by a hosting-based remote administration service. Other embodiments of this innovation may also comprise the preceding interface and access means in addition with, but not limited to, dial-up, digital cellular, UWB, Bluetooth, Wi Fi, HomePlug, (and)/or other Ethernet compatible networks.

[0219] Another embodiment of the preceding may comprise a display and at least one input button or a touchscreen display for the networked timer administration component. The administration means (including the associated program) may also comprise an administration interface and program similar to what has been described in the pedestal 22 controller and timer module narrative. In addition, any highly reliable wireless coded receiver apparatus or like embodiment, such as, for example, a ZigBee-equipped present invention innovation, may also be adapted to perform with the timer and ZigBee-equipped remote control, such as the personal communicator 250, thus adding greater utility over present timers or timer-equipped devices.

[0220] One skilled in the art understands the numerous embodiments that may be adapted with or comprise the networked timer, from lighting fixtures such as a lamp multt-device controller as noted in Figure 6, to appliances. For example, one present



invention embodiment may be a networked refrigerator with a multi-device networked timer, which may also comprise a controller function and interface which may be similar to what was described in the previous narrative associated with pedestal 22. The networked refrigerator may also comprise a Wi Fi communications component. The networked refrigerator may also comprise a Home Area Network (HAN) URL or, for example, intranet or extranet IP or web address where the address may support a PC or pocket PC or PDA or smart phone or other like device that comprises a browser-based network access means (including a present invention personal communicator 250 or remote control means embodiment) for administering the networked timer device (which may also be in a timer and device controller embodiment which will be described further in the narrative). Some of the advantages of the present invention refrigerator embodiment are the power means application or, more specifically, the desire to have the appliance operating and thus powered all of the time; and the trend in home upgrades, particularly kitchen upgrades; the acceptance and popularity of home networks and the interest in home appliance networking. In yet another appliance embodiment of said timer, said timer may be in a television embodiment, wherein the administration interface of said timer system may be a remote control unit adapted for administering said timer embodiment.

[0221] In keeping with the focus of adapting the networked timer to an apparatus where the combination creates an embodiment that supports widespread acceptance and use and serves as a means for applying the utilities of the present invention system and innovations described herein and associated embodiments, one of the innovation embodiments that incorporates the focus is a Wi Fi router and ZigBee full function device router/controller with a timer program, processor, and associated features and functions.

[0222] The communications router and timer apparatus may be in a variety of additional embodiments. One apparatus may comprise: a Wi Fi router component